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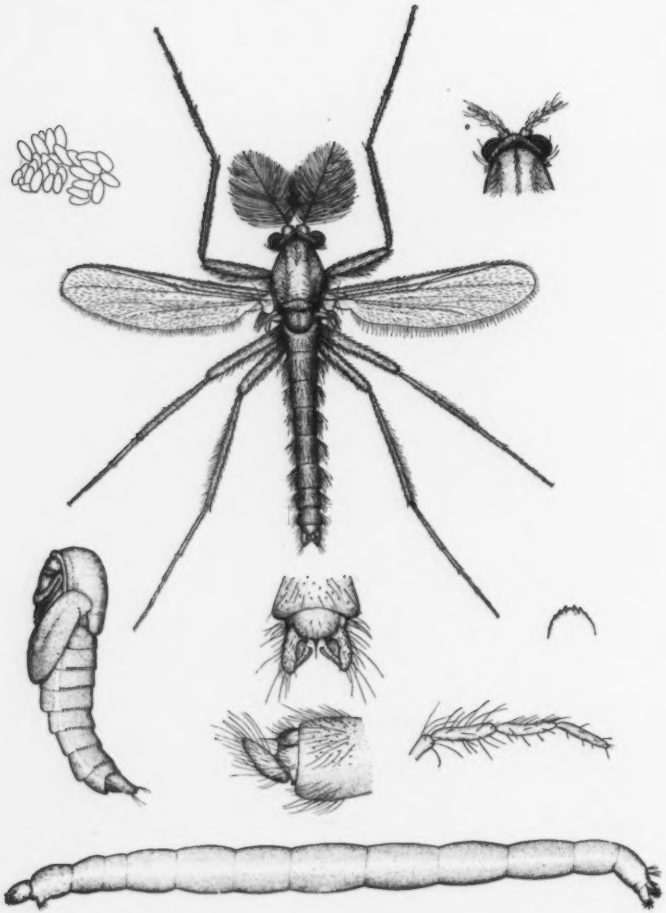

METRIOCNEMUS EDWARDSI—JONES.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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Two Insect Associates of the California Pitcher-plant, Darlingtonia californica (Dipt.)

By FRANK MORTON JONES, Wilmington, Delaware.

(Plates XX, XXI.)

Metriocnemus edwardsi nov. sp. (Diptera: Chironomidae.) (Plate XX.)

In September, 1875, Mr. Henry Edwards communicated to the California Academy of Sciences the results of his observations on the insect associates of the California Pitcher-plant, *Darlingtonia californica*. Following thus closely after Mellichamp's and Riley's papers on our eastern Sarracenias and their insect victims and guests, it is noteworthy that *Darlingtonia*, by its peculiar structure, its insect-catching activity, and the number and variety of its victims evidently closely com-

parable with the better known Sarracenias, yet seemed to be almost destitute of insect associates other than victims of its traps. For example, with our eastern *Sarracenia purpurea*, from Canada to the Gulf, are found *Exyra rolandiana, Wyeomyia smithii, Metriocnemus knabi, Sarcophaga sarraceniae* (or related species), *Papaipema appassionata, Olethreutes daeckeana,* and other less constant associates; in *Darlingtonia* Mr. Edwards found only numerous small spiders (these are also abundant in *Sarracenia*) and "invariably .....among the mass of decay some living larvae of a small dipterous insect, probably one of the *Tipulidae.*"

By the examination of numerous freshly-gathered vigorous plants of *Darlingtonia* furnished me at intervals through the summer of 1915 by Mr. A. A. Heller and Mr. G. M. Pendleton, I secured many living examples of the small dipterous larva noticed by Mr. Edwards, and also of another and larger species, both of which I succeeded in rearing in some numbers. The former proves to be closely related to *Metriocnemus knabi* Coq., the almost invariable associate of *Sarracenia purpurea,* differing but little in the imago, but as might be anticipated presenting more evident structural divergence in the larva and pupa; for the water-filled leaf of *purpurea* offers to the early stages of *knabi* a habitat almost strictly aquatic, whereas the new species, which may be called *Metriocnemus edwardsi,* seems perfectly at home among the insect remains in *Darlingtonia* as long as they are even slightly moist, and its pupal stage is passed, not as by *knabi* enclosed in a watery welt-like gelatinous mass on the inner wall of the pitcher, but (in captivity) outside the leaf, naked and loosely adherent to the moist basal portion of the plant or in the adjacent moss, over which it wriggles actively when disturbed. A single egg-mass, probably unfertilized, was obtained by confining the flies with *Darlingtonia* leaves and moist moss, but as they were not detected until after the death of the female which was found clinging to the partially-dried egg-mass, it is possible that further observation may modify the following description of the eggs and their method of deposition.

Egg.—Approximately circular in cross section, elongated, slightly more pointed at one end, clear pale yellow in color, of smooth and somewhat polished texture; length .22 mm.; cross diameter .11 mm.; deposited in a strongly adherent irregular mass; examined and measured at 100 X.

Larva.—Slender, almost cylindrical; smooth, pale, but darker than *knabi* and of a decidedly brownish rather than yellow-white tone; head darker, tending toward pale ferruginous; eye-spots black, prominent, sub-oval, not so obviously formed by the fusion of two spots as in *knabi;* antennae inconspicuous, shorter than in *knabi;* mandibles and labium dark brown, the former with five teeth proportioned as in *knabi* (Knab's illustration), the latter with a single pair of small teeth medially (not two pairs as in *knabi*) followed by a series of larger ones; claws of anterior and posterior prolegs yellowish-brown, in form as in *knabi;* dorso-caudal papillae slightly darkened and much lower, smaller, and less conspicuous than in *knabi,* in height about once their diameter, and armed with fine black setae which are often appressed into apparently one; some of these setae are frequently broken at various lengths or entirely missing, and the normal full number is probably six; four retractile anal blood-gills on the twelfth segment; length before pupation about 7 mm.

Pupa.—At first pale, soon darkening to dull brown and then to almost black with the pigmentation of the enclosed imago; of the usual form, with enlarged thorax but without projecting respiratory tubes or filaments; caudal end broadened, paddle-like, partly cleft, the two flattened lobes held in the same plane and rounded, each with three fine black setae usually appressed and appearing as a single tapering bristle on its exterior edge; the abdominal segments near their dorsal posterior edge have a fringe of short stout downward-pointing spines, amber-colored tipped with brown. The pupa is naked and quite active, travelling over moist surfaces with considerable facility. The duration of this stage is very short.

♂. Smoky brown to black; antennae 14-jointed, strongly plumose with black hairs, the disc-like basal joint more densely colored than the remaining somewhat translucent joints; eyes black; palpi four-jointed, the first joint shortened and bulb-like, the remaining three of approximately equal length, the first three joints bearing long hairs, the last joint with a few very short fine ones.

Thorax dark, concolorous, and with three lines of hairs springing from minute polished black rounded granules, the median line posteriorly abbreviated at less than half the length of the mesonotum, the lateral lines broadening and terminating only slightly in advance of the scutellum; a minute double pit medially, in line with the termination of

the lateral stripes; post alar callus somewhat produced and flattened, strongly haired; prealar callus protuberant, roughened, and strongly haired; scutellum narrow, rounded, pale brownish-gray, with a transverse row of long fine hairs; post-scutellum deep dull black, faintly polished and obscurely pitted; halteres club-shaped, usually pale, but smoky in heavily-pigmented examples; legs smoky brown with dark vestiture, the femora hairy; vestiture of tibiae shorter, though successively longer and more hair-like on the second and third pairs; front metatarsi about half the length of their tibiae; all tibiae spurred. Wings not very densely clothed with fine short gray-brown hairs, stronger on the costal edge; the R-M cross-vein either barely in contact with the radius without fusion, or in some examples failing to reach the radius by its own width; fork of cubitus slightly distad of origin of cross-vein.

Abdomen unmarked, smoky brown to dull black; clothed dorsally and ventrally with long hairs, black but in some lights with pale brown reflections, springing from slightly elevated polished bases; hypopygium with a central needle-like dorsal keel, the point translucent, the broadened rounded base hairy; its lateral lobes strongly haired, their slender inward-hinged terminal joints somewhat clubshaped and ending with a pointed lateral projection on each. Length, dry examples, 3 mm.; in balsam, nearly 4 mm.

♀. Much paler and more yellowish-brown than the male; the abdomen distended, not so conspicuously hairy; the wings slightly shorter and broader; antennae of six visible joints, the disc-like basal joint smaller than in the ♂ and yellowish-brown; the second joint slightly larger than the remaining four, which are of nearly equal length; all but the basal and terminal joints bear a few long sub-erect hairs; hairs of terminal joint very fine and short; palpi as in the ♂; eyes black; thorax more densely colored than the abdomen; its hairs pale yellowish-brown; leg-vestiture dark. The large bodied females shrink so in drying that measurements of them are deceptive; in balsam they slightly exceed the ♂ in length.

Described and illustrated from many examples of both sexes, of which I designate as types, ♂ and ♀, a pair mounted dry and deposited in the U. S. National Museum (Cat. No. 20317); paratypes are with the Academy of Natural Sciences, Philadelphia, and in my own collection.

Type locality, Mount Eddy, near Sisson, Siskiyou County, California; occurrence of larvae, pupae and flies, apparently throughout the warm months; hibernation probably as larvae of various ages.

This insect, which I provisionally describe under *Metriocnemus,* eventually may find its place in a related genus; *knabi* already has been separated by a European student of the group, who finds that it has well-developed pulvilli, a character which I have been unable to detect in *edwardsi;* slides of the ♂ genitalia of the two species indicate that in *knabi* the keel is shorter, slighter and more transparent, and the lateral lobes proportionately shorter and broader. The presence of larvae of *edwardsi* in almost every suitable leaf of *Darlingtonia* containing insect remains indicates that its association with this plant, like that of *knabi* with *purpurea,* is habitual, and possibly exclusive.

In the leaves of *Darlingtonia,* along with the larvae of *Metriocnemus* and as far as was observed living in amicable relationship with them, was found another dipterous larva sharing the same food-supply of captured insects. The larvae of the two species, often more or less entwined in their confined quarters, are not conspicuously different in size or form though separable to the naked eye by their different methods of progression; under low magnification it becomes immediately apparent that their relationship is remote. Eggs and empty puparia were also found in abundance in the leaves, and from the larvae numerous flies were bred to maturity. These prove to belong to the family *Chloropidae,* and, I am informed, belong to one of the three or more species standing in American collections under the name of *Botanobia trigramma* Loew; *trigramma* was described from the District of Columbia, its size is given as only about half the average and much less than the apparent minimum size of the present species, for which I propose the name of

Botanobia darlingtoniae n. sp. (Diptera: Chloropidae.) (Plate XXI.)

The eggs of this fly are deposited singly on the inner wall of the leaf, above the mass of insect remains and often well up toward the orifice of the pitcher; they are not strongly adherent and are frequently wedged under the fine elastic hairs which clothe the leaf-wall. From one to twenty eggs may be

found in a leaf, but even when most numerous they do not appear to have been laid in groups or clusters, and the maximum number is attributable to the visits of more than one female to the same leaf.

Egg.—Cigar-shaped, roundedly-pointed at one end, the other with a short cylindrical or collar-like cap of less diameter than the body of the egg; obscurely and shallowly wrinkled longitudinally; white, opaque, pearly, faintly polished, under 100 X finely punctate; length .9 mm., and greatest diameter .2 mm.

Larva.—Slender, cylindrical, tapering and strongly retractile anteriorly; white, translucent, smooth, but segmentally with narrow ventral fusiform areas marked by short acute granules, coarser beneath and fading out laterally; black cephalo-pharyngeal skeleton with two great hooks visible through the translucent anterior segments; anterior spiracle inconspicuous, few-lobed, concolorous, not protruded; the two posterior dorsal stigmata in form of even-armed crosses surmounting prominent dome-shaped processes, the inner arm of each cross partially obliterated by the circular extremities of the tracheal tubes; anal lobes low, smoothly rounded; extreme length about 5 mm. The larvae are active, moving freely about among the insect remains and climbing up the vertical wall of the pitcher in search of food or when ready to pupate.

Puparium.—Shorter and stouter than the larva and hardening to a dull bronzy-brown color; flattened ventrally where in contact with the leaf; segmentation not distinct; first visible segment flattened, transversely wrinkled, darker in color; anterior spiracles small, hand-like, slightly projecting, black; second segment low-arched, the succeeding segments more highly arched until posteriorly they become almost cylindrical; the anterior segments on their lateral edges above have a well marked longitudinal angular depression, outside of which the margin is produced and rounded; the terminal dome-shaped processes bearing the shrunken larval stigmata are prominent but less regularly shaped than in the larva, concentrically wrinkled, and the dorsal area immediately preceding them is also roughened and transversely wrinkled; length, 3.5 mm.; pupation usually occurs among the dry insect remains or on the inner wall of the leaf often well up toward the orifice or even in the hood; pupal stage (in August) eight to ten days.

♂ ♀. Black, head and thorax not shining, surface roughened and thinly white-pollinose; mesonotum and scutellum studded with short spine-like black hairs; mesonotum three-striped, with an additional abbreviated dark stripe above each wing base; abdomen dark brown above (almost black when dry), broad, flattened, slightly glossed, microscopically punctate, finely haired; legs yellow and black.

Eyes widely separated, dark bronzy brown, finely pubescent; ocellar tubercle slightly raised, usually paler by denser pollinosity, the anterior ocellus inclined on its front edge; no frontal triangle, but a prominent slightly sunken narrowly oval dark marking, laterally pale-bordered, extending forward from anterior ocellus; orbits pale gray, those of the front sometimes tinged with brownish-yellow; the front produced, broadly snout-like, over the base of the antennae, this produced and rounded area being pale dull brownish-yellow, with several rows of recumbent and convergent hairs; a pair of post-ocellar bristles, erect, converging, their points crossed; these, with a pair of erect and divergent outer verticals, are the strongest of the head bristles, which are black, usually from black bases.

Antennae large, directed laterally, appressed to head; the first joint hidden, the second broadly bell-shaped, yellow often partially obscured with dark and with a marginal row of spur-like hairs from black bases; the third joint much enlarged, longer than broad, rounded apically, basally on inner side dull salmon-yellow, sometimes ferruginous, the remainder dark purplish gray, almost black, and both joints thinly and finely white pollinose; arista black and tapering, shortly and sparsely haired. The cheeks produced in advance of the face, in color pale dull brown sometimes varying to and always merging into the gray of the posterior orbits; cheeks conspicuously marked with black dots which form the bases of recumbent forward-pointing hairs; a pair of well-differentiated brown vibrissal hairs; the black dots continued in a regular row around the posterior orbits. Face black; clypeus and well defined median carina pale. Mesonotum with a narrow black median stripe (a dull black area destitute of pollen) extending to scutellum, two similar lateral stripes abbreviated slightly in advance of scutellum, and two short dark markings above the wing bases. On each side two humeral bristles, one to two anterior and two posterior notopleurals, two post alar and one pre-scutellar; the uppermost anterior notopleural weak and apparently sometimes missing.

Scutellum broad, rounded, almost semi-circular in outline, discally flattened, in color and texture like the mesonotum, but laterally broadly darker; marginal scutellars black, four pairs distinguishable; median pair best developed, their points approaching or crossed.

Halteres long, club-shaped, white, unmarked, their stems sometimes darkened to almost black.

Wings transparent, unmarked, iridescent, their surface roughened with minute evenly distributed rasp-like hairs; veins dark brown; anterior edge closely set with short bristly hairs directed obliquely forward, gradually merging into the short fine even-length fringe; the costal thickening obvious to V 1 plus 2 (4th longitudinal); axillary incision very deeply out, its extremity rounded, separating from the rest

of the wing a long finger-shaped axillary lobe which is edged interiorly with long black hairs; second and third costal divisions equal, each twice as long as first; hind cross-vein twice its length from small cross-vein; III 4 plus 5 and V 1 plus 2 (third and fourth longitudinal) parallel.

Femora and tibiae set with stiff hairs; femora black usually shortly tipped with ferruginous yellow; tibiae yellow, broadly black-banded beyond the middle; tarsi yellow, terminal joints darkened to almost black; middle and hind legs with short tibial spurs.

Abdomen as stated, that of the ♂ rounded posteriorly, of the ♀ with an extruded hypopygium which is slender, tapering, finely haired, furcate and appressed, a long bristle terminating each fork; lateral and ventral posterior margins of segments gray-edged.

Average length, dry specimens, ♂, 2.1 mm.; ♀, 2.4 mm.; minimum and maximum of twelve examples 1.9 mm. and 2.8 mm.

Type locality Mount Eddy, near Sisson, Siskiyou County, California; types ♂ and ♀, are in the U. S. National Museum (Cat. No. 20318), paratypes with the Academy of Natural Sciences, Philadelphia, and in my own collection.

Eggs, larvae and puparia were abundant in the plants July 26; emergences of the flies took place from July 29th to August 19th; plants examined September 26th contained many empty puparia, no living early stages, and a single ♀ fly, indicating probable hibernation in the final stage.

In the preparation of this paper I am indebted to several entomologists for examination of specimens and courteous reply to my inquiries, and especially to Mr. Frederick Knab and Mr. E. T. Cresson, Jr., without whose generous assistance and criticism its completion would have been most difficult.

EXPLANATION OF PLATES.

PLATE XX.

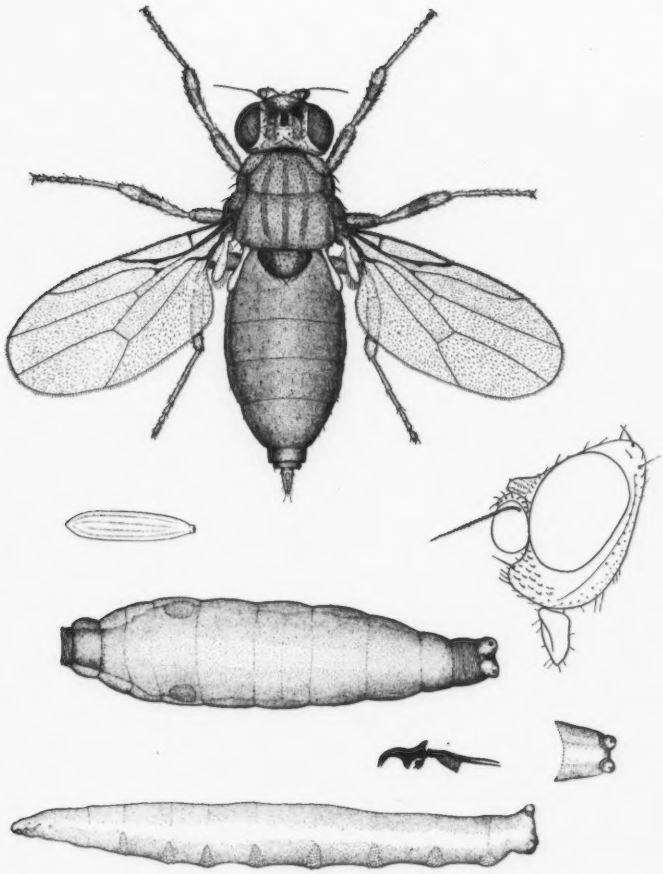
Metriocnemus edwardsi. Egg mass, male, female head, pupa, male genitalia, labium of larva, male palpus, larva.

PLATE XXI.

Botanobia darlingtoniae. Female, egg, head-profile, puparium, larva, cephalopharyngeal skeleton, dorsal view of caudal end of larva.

Change of Address.

Mr. NATHAN BANKS, of East Falls Church, Va., Assistant Entomologist, Division of Entomology, U. S. Dept. of Agriculture, since 1896, announces that, after November 1, his address will be Museum of Comparative Zoology, Cambridge, Mass.



BOTANOBIA DARLINGTONIAE—JONES.

On the Types of Certain Noctuid Genera occurring in North America (Lepid.).

By J. McDUNNOUGH, PH.D., Decatur, Illinois.

In the course of the preparation of a list of North American Lepidoptera the problem has presented itself to us as to whether the genera of the Noctuidae as used by Sir George Hampson, in the *Catalogue of the Lepidoptera Phalaenae of the British Museum,* can be accepted according to the current codes on nomenclature. Sir George Hampson has in every instance, irrespective of the work of any previous entomologist, fixed the type of each genus, when not particularly specified by the author, as the *first species* placed under the generic name; this procedure has resulted in numerous alterations in our usual conception of the Noctuid genera and in many instances of most confusing interchanges of generic names. While personally we are rather in favor of this "first species" principle of type fixation we find both from personal conversation and from our correspondence that the majority of systematists are decidedly against such a procedure and are more or less agreed that the type of a genus should be fixed according to rules such as are laid down in Banks & Caudell's *Entomological Code,* Washington, 1912. Believing that the true interests of science will be better served if we abandon our own personal leanings and follow the ruling of the majority we have endeavored in the following paper to give the results of our search for the types of a number of Noctuid genera according to the rules of the above-mentioned Code, and it will doubtless be noted with pleasure by non-systematic entomologists that by this method the old conception of many genera has again been restored.

We have decided to disregard Hübner's *Tentamen* names and credit them mostly to Ochsenheimer (1816); even if later it be decided that the *Tentamen* is valid and the genera therefore be attributed to Hübner very little change in the generic conception will be necessary as in most instances the genotype proves to be the species mentioned by Hübner in the aforesaid work.

The sequence is that of Hampson's Catalogue and we have in general confined ourselves in this article to those genera the genotype of which, as determined by our method, is markedly different from that as determined by Hampson.

Heliothis Ochs., 1816.

Type designated by Duponchel (1829, Lep. Fr. VII (2) p. 71) as *dipsacea* L. and confirmed by Curtis (1836, Br. Ent.), Westwood (Gen. Syn. 1840), Guenée (1852, Hist. Nat. Lep. Noct. II, 181), and Grote (1874, Buff. Bull. II, 35). Hampson's conception of the genus with *cardui* Esp. as type cannot stand; *Heliothis* will replace *Chloridea* West. as used by Hampson.

Melicleptria Hbn. (1825).

Type designated by Grote (l. c. I, 116, 1873) as *cardui* Hbn. *Anthoecia* Bdv. (1840) will fall before *Melicleptria*, the type having been designated by Guenée (1852, l. c. II, 187) as *cardui* Hbn. This genus will replace *Heliothis* as used by Hampson, whilst *Canthylidia* Butl. may apparently be used for his conception of *Melicleptria*.

Agrotis Ochs. (1816).

Type designated by Curtis (1827, Brit. Ent.) as *segetum* Schiff. and confirmed by Westwood (1839) and Grote (1874). Hampson places *segetum* in *Euxoa*, owing doubtless to the slightly tuberculate front; the male genitalia as figured by Burrows & Pierce (Gen. Brit. Noct.) show however a structure of the harpe quite dissimilar to the bifid one characteristic of Grote's genus *Carneades* which is made a synonym of *Euxoa* by Hampson. The type of *Euxoa* has been fixed by Hampson as *decora* Schiff. and a study of the genitalia of this species will be necessary before we can determine with certainty the correct usage of these three genera. According to J. B. Smith's revision of the Agrotid moths *segetum* is structurally very closely related to *ypsilon* so that very possibly Hampson's usage of *Agrotis* may be in a broad sense correct.

Noctua Linn (1758).

The first real designation of the type of this genus seems to have been by Latreille in 1810 as *pronuba* Linn., Duponchel's designation of *exclamationis* L. as type in 1829 being thus invalid. *Pronuba* being designated by Duponchel (1829) as the type of *Triphaena* Ochs. it would seem that *Triphaena* falls as a synonym of *Noctua* L. In any case Hampson's usage of *Noctua* with *strix* as type and of *Triphaena* (which he credits to Hübner) with *interjecta* as type will certainly not hold. *Pronuba* is placed by Hampson under *Agrotis* and, if this association be correct, it will cause *Agrotis* possibly to fall before *Noctua*, but as we have already stated more careful study of the structure of

the generic types is necessary to establish the relationships of the various Agrotid genera. Our N. American species listed by Hampson under *Triphaena* will fall into *Rynchagrotis* Sm. as the type of this genus was distinctly stated by Smith in his Agrotid revision (p. 9) to be *cupida* Grt. For further references regarding the types of *Noctua* and *Triphaena* we would refer the reader to a paper by Grote in Proc. Am. Phil. Soc. Vol. XLI, 1902.

Mythimna Ochs. (1816).

The type was first specified by Duponchel in 1829 as *albipuncta* Fabr., but Hübner in 1822 (Verz. p. 239) had already restricted the genus to *oxalina* Hbn. and *acetosellae* Schiff., a fact which was overlooked by all subsequent authors. Hampson's usage with *oxalina* as type would be therefore correct. *Mesogona* Bdv., the type of which was specified by Guenée (1852) as *acetosella* Schiff., will fall as a synonym.

Eurois Hbn. (1822).

Type specified by Grote (1874, Buff. Bull. II, 12) as *occulta* L. and the genus will probably fall before *Lycophotia* Hbn., the type of which Hampson specifies as *porphyria* Schiff. Hampson's usage of *Eurois* with *prasina* L. as type is incorrect. *Aplecta* Gn. (placed in the synonymy by Hampson) cannot be used in its place as the type was designated by Guenée (1852) as *nebulosa* Hfn., a hairy-eyed species placed by Hampson in *Polia*. *Matuta* Grt. (type *tenebrifera* Wlk.) must apparently be used.

Polia Ochs. (1816).

The type of the genus was designated by Curtis in 1828 as *nebulosa* Hfn. Hampson's usage of the genus is therefore correct. Duponchel's fixation in 1829 of the type as *compta* Esp. (*concinna* Hbn.) is antedated by Curtis' action.

Mamestra Ochs. (1816).

The type was designated by Duponchel in 1829 as *brassicae* L. Grote, however, justly contends that Hübner's restriction of the genus in the *Verzeichniss* (p. 214) rendered Duponchel's action *ultra vires* and specifies the type as *pisi* L., which would cause *Mamestra* to fall as a synonym of *Polia*.

Xylomyges Gn. (1852).

Grote specified the type of the genus in 1874 as *conspicillaris* Schiff. and Guenée's name will therefore replace *Xylomania* Hamp.

Hadena Schr. (1802).

The type of this genus has been variously chosen by Duponchel, Curtis, Westwood and Guenée, but none of the authors has mentioned one of the original specimens as type. Grote (Ent. Rec. VI, 78, 1895) designates the type as *cucubali* Schiff. and makes *Dianthoecia* Bdv. synonymous. We would refer students to this paper and to the paper

in Proc. Am. Phil. Soc. 1902, p. 13, for further evidence. Lederer's conception of *Hadena* which has been followed largely in Europe cannot hold nor can Hampson's with *reticulata* Will. (*typica*) as type. In place of *Hadena* as used by Hampson *Neuria* Gn. may be used.

Meliana Curt. (*Melia* Curt.) (1828).

Hampson's use of this as a Noctuid genus with type *flammea* Curt. is quite erroneous, as Curtis designates the type of the genus as *sociella*, one of the *Galleriinae*. Curtis in the text uses the spelling *Melia*, which name is preoccupied, but in the index he has changed it to *Meliana*, either in error or on account of discovering that the generic name already existed. *Neleucania* Sm. may again be substituted for *Meliana*.

Orthosia Ochs. (1816).

Curtis specified the type in 1828 as *instabilis* Schiff. (*incerta* Hufn.). This genus will therefore replace *Momina* Hbn. as used by Hampson. If the Tentamen be adopted *Orthosia* will fall to *Graphiphora* Hbn. with type *gothica;* otherwise *Graphiphora* Ochs. (1816) will fall in the *Agrotinae* with type specified in 1839 as *c-nigrum* by Westwood.

Cloantha Gn. (1839).

The type was specified by Guenée in 1852 as *perspicillaris* Schiff. (*polyodon* Cl.). Hampson in Vol. IV of his Catalogue sinks *Chloantha* Gn. (*sic*) with type *hyperici* Schiff. to *Actinotia* Hbn. and later in Vol. VI. uses the name *Cloantha* with same reference and type as *solidaginis* Linn. The first reference is correct in the light of Guenée's type fixation; *Xylophasia* Steph., the type of which was fixed by Westwood (1840) as *polyodon*, will also become a synonym of *Actinotia*. In Vol. VI the name will be replaced by *Lithomoia* Hbn., the type of which was fixed by Curtis in 1838 as *solidaginis* Hbn.; in place of *Lithomoia* as used by Hampson *Hyppa* Dup. should again be valid.

Xylena Ochs. (1816).

Misspelt *Xylina* by Treitschke and all following authors. The type was designated in 1829 by both Curtis and Duponchel as *exoleta* L. so that Hampson's usage is perfectly correct.

Tethea Ochs. (1816).

Type specified in 1829 by Curtis as *or* Fabr. and the genus therefore falls into the *Thyatiridae*. Hübner in 1822 had already restricted the genus to *duplaris* L. and *fluctuosa* Hbn. which are congeneric with *or*.

Atethmia Hbn. (1822).

The type of the genus was designated by Grote in 1874 as *xerampelina* Hbn.; later in 1895 he changes this to *subusta* Hbn., but his first action must hold. *Cirrhoedia* Gn., with type specified by the author as *xerampelina* Esp., will fall as a synonym. Hampson's usage is correct.

Xanthia Ochs. (1816).

The generic type was specified by Curtis (1825) as *flavago* Fabr. (*lutea* Strom) and *Xanthia* will therefore replace the genus *Cosmia* of Hampson.

Glaea Steph.

The genus, apart from the *Tentamen*, was apparently first used by Stephens in 1829 and *vaccinii* L. specified as type by Curtis in the same year; it will therefore sink to *Conistra* Hbn.

Cosmia Ochs. (1816).

Duponchel specified the type as *diffinis* Linn. in 1829; the genus must replace *Calymnia* Hbn. as used by Hampson.

Parastichtis Hbn. (1822).

Grote specified the type of this genus (Can. Ent. 1900, p. 212) as *suspecta* Hbn. The genus therefore replaces *Amathes* Hbn. of Hampson, which in any case could not be used as Hampson uses it, the type having been fixed by Grote in 1895 (Ent. Rec.) as *baja* L.; for *Parastichtis* as used by Hampson, *Septis* Hbn. is apparently the only available generic name.

Trachea Ochs. (1816).

Hampson's usage is correct in a broad sense as the type of the genus was restricted by Hübner in 1822 to *atriplicis* L. and specified by both Curtis (1839) and Westwood (1839) as the same species.

Perigia Gn.

Type specified by Grote (1874) as *xanthoides* Gn.; Hampson's usage is correct.

Oligia Hbn. (1822).

Type specified by Grote (1895) as *strigilis* L. *Miana* Steph. with the same type, fixed by Westwood in 1839, falls as a synonym. Hampson's usage is again correct.

Luperina Bdv. (1829).

The type was fixed by Duponchel in 1829 as *testacea* Schiff. and this usage is followed by Guenée, Grote and Hampson.

Caradrina Ochs. (1816).

The type was designated in 1829 by Duponchel as *i-intactum* Hbn.; Hübner however in the *Verzeichniss* had already restricted the genus to the species *neglecta* Hbn., *respersa* Schiff., *laevis* Hbn., *blanda* Schiff., *alsines* Bork. and *taraxaci* Hbn., so that Duponchel's designation was presumably incorrect. Curtis in 1837 gave *morpheus* as the type and Westwood in 1840 *cubicularis* Schiff., both of which for the same reason cannot be accepted. Guenée in 1852 named *alsines* Bork. as type and this, being one of the species included in Hübner's restriction, is valid. *Caradrina* will therefore replace *Athetis* Hbn. as used by Hampson.

Trigonophora Hbn. (1822).

The type was specified by Grote (1874) as *empyrea* Hbn. (*flammea* Esp.) and the genus must therefore replace *Rhizotype* Hamp. (l. c. Vol. VI, 373) leaving *Phlogophora* Tr. with type *meticulosa* L., fixed by Duponchel in 1829, to be used in its place. *Solenophora* H. S. and *Brotolomia* Led. fall as synonyms.

Callopistria Hbn. (1822).

This genus will have priority over *Eriopus* Tr. according to the latest investigations regarding the dates of the various parts of the *Verzeichniss* (*vide* Ann. Mag. N. Hist. Jan. 1912).

Bryophila Tr. (1825).

This genus, the type of which was designated by Duponchel (1829) as *glandifera* Schiff. (*muralis*), will fall before *Metachrostis* Hbn. (1822), the type of which is fixed by Hampson as *muralis* Forst.

Diphthera Ochs. (1816).

The type was fixed by Duponchel (1829) as *orion* Esp. and the genus must therefore replace *Daseochaeta* Warr. as used by Hampson (l. c. Vol. VIII, p. 22).

Acronycta Ochs. (1816).

Type fixed by Duponchel (1829) as *leporina* L. following Hübner's restriction in 1822 to *leporina* and *bradyporina*.

Lithomoia Hbn. (1822).

The type was fixed by Curtis (1838) as *solidaginis* Hbn. the genus however being misspelled *Lithomia*. As already stated *Hyppa* Dup. will be used in place of Hampson's *Lithomoia*.

Gortyna Ochs. (1816).

The genus was restricted in 1822 by Hübner to the single species *micacea* Esp. We imagine therefore that Grote (Ent. Rec. 1895) is correct in designating this species as type and overlooking the naming by Curtis, Westwood and Guenée of *flavago* Schiff. as type. If Grote be followed *Gortyna* will replace *Hydroecia*, the type of which was specified by Guenée (1852) as *micacea* Esp. Instead of *Gortyna* as used by Hampson Lederer's genus *Helotropha* may be employed.

Apamea Ochs. (1816).

The type of the genus was fixed in 1829 by Curtis as *chrysographa* Schiff. (*nictitans* L.); Grote's remarks (1902 Proc. Am. Phil. Soc. XLI) are hardly to the point after Curtis' action. Hampson's usage is correct.

Nonagria Ochs. (1816).

Type designated by Duponchel in 1829 as *typhae* Hbn. and *Nonagria* will therefore replace *Phragmatiphila* Hamp. a genus not represented

in N. America. *Senta* Steph. should apparently be used for *Nonagria* as employed by Hampson (*vide* Grote, 6th Rep. Peab. Acad. p. 29).

Calamia Hbn. (1822).

This genus, erected in 1822 for the three species *virens* L. *phragmitis* Hbn. and *fluxa* Hbn. was restricted by Lederer (1857, Noct. Eur. p. 125) to *phragmitis* Hbn. and *lutosa* Hbn.; as the former species is the only one of the original species included it virtually became type in 1857 and has been employed in this sense by all later authors. With *phragmitis* as type *Calamia* will replace *Arenostola* Hamp., leaving *Luceria* Hein. to be employed for Hampson's *Calamia*.

Erastria Ochs. (1816).

Type designated by Curtis in 1826 as *uncana* L. The genus will therefore replace *Eustrotia* Hbn. (type *unca* Schiff.) and *Emmelia* Hbn. must be used to replace *Erastria* of Hampson.

Acontia Ochs. (1816).

Hampson's usage is apparently correct as Hübner restricted the genus to the sole species *malvae* in 1825 (Verz. p. 257) and the later actions of Curtis, Duponchel and Guenée were therefore *ultra vires*.

Euclidia Ochs. (1816).

Type was specified by Duponchel in 1829 as *glyphica* L. and the genus will therefore replace *Gonospileia* Hbn. as used by Hampson.

Drasteria Hbn. (1818).

The genus was first used in the *Zuträge* in connection with *graphica* Hbn. which therefore as sole species becomes the type; it has been misapplied by Guenée for *erechtea* and allies and in this later authors have concurred.

Mocis Hbn. (1825).

This genus was restricted by Guenée (1852) to a group which included only *levina* Stoll of the original species which thus virtually became type at this time and would replace *Celiptera* Gn. as used by Hampson, although the two genera may be held separate on secondary sexual characters. In place of *Mocis* as employed by Hampson *Pelamia* Gn. (syn. *Remigia* Gn.) must be employed.

Colocasia Ochs. (1816).

Type was specified by Guenée in 1852 as *geographica* Fabr. but in view of Hübner's restriction in the *Verzeichniss* 1825 to *coryli* L. and *scoriacea* Esp. Hampson's usage with *coryli* as type must be held correct.

Panthea Hbn. (1825).

This genus, erected for the sole species *coenobita* Esp., will replace *Diphtera* Ochs. as used by Hampson.

Moma Hbn. (1822).

The genus was restricted by Lederer in 1859 to the sole species *orion* Esp. (*aprilina* Hbn.) which thus virtually became type and Grote's action in 1875 in selecting *astur* Cram. as the type of *Moma* can hardly be followed. *Moma* in our opinion will sink to *Diphtera* Ochs. and *Trichosea* Grt. will replace *Moma* as used by Hampson. This will necessitate changing the family name *Mominae* and we propose instead to use *Pantheinae*.

Phytometra Haw. (1809).

Following Stephens' doubtful restriction in 1829 the type of the genus was designated by Westwood in 1840 as *aenea* Schiff.; *Prothymia* Hbn. with the same species as type will fall as a synonym; *Autographa* Hbn., the type of which was fixed by Grote in 1895 as *gamma* L., will replace *Phytometra* of Hampson and the family name may be changed to *Plusiinae*. *Parilis* Hbn., the sole species placed by Hampson in the genus *Autographa*, may for the present be removed to *Syngrapha* Hbn., the type of which Grote designated as *devergens* Hbn. in 1895, the two species differing merely in some slight points of tibial spining. For *Syngrapha* as used by Hampson it may be necessary to erect a new genus but we would leave this to some future reviser to decide.

Plusia Ochs. (1816).

The type of the genus was fixed in 1829 by Duponchel as *chrysitis* L. Hampson does not separate *Plusia* from *Autographa* but for the present we would prefer to associate *Plusia* with the species of a metallic lustre; if Hampson be followed *Plusia* has priority over *Autographa*.

Caloplusia Sm. (1891).

The genus was apparently first mentioned in the Brooklyn Bull. VII, p. 68, 1884, but unassociated with any named species; in the 1891 Check List Smith uses it for *devergens* and *hochenwarthi;* the latter species being designated as type by Hampson, the genus therefore falls to *Syngrapha* Hbn.

In conclusion we give a partial list of some of the most important works where generic types of Noctuidae have been definitely designated.

Curtis. British Entomology, Lepidoptera, 1824-39.

Duponchel. Hist. Nat. d. Lépid, de France VII (2), 71, 1829.

Grote. Buffalo Bull. II, 5, 1874. Ent. Record. VI, 27, 1895. List N. Am. Eupterotidae, etc. (Ab. Naturw. Verein, Bremen) 1895. Proc. Am. Phil. Soc. XLI, 1902.

Guenée. Hist. Nat. des Lepid. Vols. V-VII, 1852.

Westwood. Intro. Mod. Class. Ins. Gen. Syn., 1840.

Descriptiones Hymenopterorum Chalcidoidicorum Variorum cum Observationibus. II.*

By A. A. GIRAULT, Glenndale, Maryland.

Signiphora dipterophaga new species.

♀. Length, 1.00 mm. In the table of species (Proc. U. S. National Museum, 45, pp. 227 ff.) runs to the *nigra* group and in that runs to *nigra* itself from which it differs in having the wings hyaline and the body much more robust and the caudal wings broader. Differs from *hyalinipennis* in being wholly dark metallic green except the tarsi, the marginal fringes of the fore wing are considerably shorter (those at apex being not quite a fourth of the greatest wing width), the pedicel longer (2½ times longer than wide), the club shorter. Middle femur compressed, convexed ventrad (like a dilated scape) as in *hyalinipennis* but here the middle tibial spur is black and barely longer than the stout curved spine from the dorsal aspect of the middle tibia (between middle and knee), longer in the other species. Fore wing slightly yellowish along the venation. Mandibles acutely bidentate. Caudal wings three-fourths or more the width of the fore wings. Thorax finely transversely lined, the abdomen scaly. Head lined like the thorax and with a few pin punctures scattered. Pronotum large, half the length of the scutum. Body glistening. Fore tibiae yellowish.

Described from a large number of females reared from the pupa of a dipteron collected on sugar cane in a tunnel of *Diatraea*, Diego Martin, Trinidad, British West Indies, January, 1914 (F. W. Urich).

Types: Catalogue No. 20222, United States National Museum, six females on a slide.

Coccophagus aleurodici new species.

♀. Length, 1.00 mm. Habitus of the species usually referred to *Prospaltella*. Lustrous purplish black, the wings hyaline, the fore tibiæ and tarsi dull yellow, funicle 3 dull white. Venation pale yellow. Club as long as the funicle and distinctly wider; funicles 1 and 3 subequal, each a third longer than wide; 2 twice longer than wide. Pedicel subequal to funicle 2, the scape pallid, except the dusky dorsal edge. Mandibles with the second tooth broadly truncate yet with its dorsal angle acute (so that there are apparently two small acute teeth and an inner truncation from the base of the second). Marginal vein somewhat longer than the submarginal, the stigmal oblique, of nearly uniform

*The first of this series was published in this journal in May, 1916, pp. 223 ff. and marked III by mistake.

width, neckless. Marginal cilia of the fore wing short, the discal cilia uniform, about twenty-three lines where the wing is broadest. Strigil large. Thorax flat, with a velvety sheen due to the dense minute scaly sculpture. Abdomen shining. Distal four tarsal joints short, the first joint long, very much longer. Middle tibial spur long, a little stout. Ovipositor not extruded. Funicle 2 and all tibiae sometimes suffused with yellow.

♂. Similar but the flagellum is filiform, the pedicel globular, the funicle joints subequal, each over twice longer than wide, the club joints each somewhat shorter. The male organ is projected for a length equal to that of the abdomen and is tapering and curved upward

Described from a large number of specimens reared from *Aleurodicus* on *Theobroma bicolor*, Trinidad, British West Indies, December, 1914 (F. W. Urich).

Types: Catalogue No. 20223, United States National Museum, two pairs on separate tags with a slide bearing one male, three females and a female head (crushed).

Encyrtus cecidomyiae Howard. Genotype of *Pseudencyrtus* Ashmead.

Original description of the species correct but the scape has a moderate uniform ventral dilation (seen mostly at apex) and thus appears rather much compressed, the dilation not being convexed. Funicle 1 is a little shorter than the pedicel and only a third longer than wide, 2 quadrate, 6 a little wider than long. The club is 3-jointed, ovate, wider than the funicle, obliquely truncate at apex. The body is not punctured but scaly with very minute setigerous punctures scattered over the thorax. The marginal vein is twice longer than wide, subequal to the postmarginal, the stigmal a third longer. The fore wing is infuscated lightly under the marginal and stigmal veins and there is a small substigmal spot directly from the end of the stigmal vein. Discal cilia of fore wing very dense, very fine, many somewhat coarser cilia proximad of the hairless line. Mandibles tridentate, the first tooth acute and longer than the subequal other two yet not projecting beyond them. Axillae just meeting, narrow. Propodeum very short at the meson, transverse. Face inflexed, the scrobes joined above. Frons not prominent, broad. Cheeks as long as the eyes. Ovipositor valves a little extruded. Abdomen depressed. Funicle joints in the male about twice longer than wide, the club solid and much longer; male scape short, greatly convexed-dilated (not twice longer than wide by far), the pedicel globular. Flagellum (male) clothed with rather long hairs. From the male and female types in the United States National Museum.

Neocatolaccus syrphidis new species.

♀. Length, 1.50 mm. Differs from *Zatropis deuterus* Crawford in having the femora concolorous and a transverse carina on the propodeum at proximal third which forms the caudal margin of a transverse sulcus of some width and which terminates laterad in a fovea at cephalic margin (two-thirds the way over to the spiracle); from *Z. catalpae* Crawford in having the transverse carina on the propodeum and all the tibiae testaceous; from *Neocatolaccus tylodermae* (Ashmead) in being very much less robust, in lacking the lateral carina on the propodeum, in having the cross-carina abbreviated (ending at the fovea but in the other species much more extended, running caudodistad from the fovea to nearly over the caudal coxa, hence to a point laterad of the spiracle and far caudad); also the spiracular sulcus is complete, distinct (in *tylodermae* abruptly cut off by the cross-carina); from *Neocatolaccus nigrocyaneus* Ashmead in having all the tibiae testaceous, *nigrocyaneus* is much more robust, lacks a cross-carina on the subglabrous propodeum and the lateral carina (but with a complete spiracular sulcus and a small fovea at cephalic margin half-way to the spiracle from the meson); also it bears two caudal tibial spurs.

Dark metallic green and with the usual flattened setae on the head and thorax; wings hyaline, the venation pale yellow; scape, pedicel (except above), legs (except coxae and femora), yellowish brown. Head and thorax finely, densely scaly punctate, the abdomen shining. Pubescence very sparse on the scutellum. Funicle 1 twice longer than wide, longer than the pedicel, 5 subquadrate. Mandibles 4-dentate. Postmarginal vein longer than the stigmal.

♂. Abdomen narrower, the legs pale except the coxae and the caudal femur; the proximal third of the abdomen is yellow (except at extreme base and the lateral margins). Antennae with two ring-joints; funicle 6 a half longer than wide, 1 nearly thrice longer than wide. Mandibles 4-dentate. Antennae yellowish.

Described from a large series of both sexes reared from a Syrphid pupa, Cocal, Trinidad, British West Indies, July, 1913 (F. W. Urich).

Types: Catalogue No. 20224, United States National Museum, three pairs on separate tags.

The genus *Zatropis* Crawford is probably a synonym of *Neocatolaccus* which has a very short propodeal neck not a distinct one; the median carina usually dilates at apex. *Zatropis*, however, may be distinguished from *Neocatolaccus* in lacking the cross-carina on the propodeum. *N. nigrocyaneus* Ashmead is not described; it is an Italian species. The male

type of *Catolaccus pallipes* Ashmead has no cross-carina on the propodeum. *Catolaccus carinatus* Howard is a *Neocatolaccus* and differs in having the pubescence less conspicuous yet much denser and quite normal; also the cross-carina of the propodeum does not limit a sulcus but a plain surface and the spiracular sulcus is a mere fovea in which is situate the spiracle; also funicle 1 is thrice longer than wide (a ♀ of *carinatus* in the United States National Museum and apparently a paratype specimen, "St. George's, Grenada, H. H. Smith"). The propodeal neck in *carinatus* is somewhat more distinct.

Eulophus magnisulcatus new species.

♀. Length, 2.00 mm. Dark metallic green, the wings hyaline, the venation, tibiae, tarsi and scape pale straw yellow. Head delicately scaly, the thorax densely scaly punctate, the propodeum more densely so and with a long median carina which joins the semi-circular carinated apex of the propodeum and a deep distinct spiracular sulcus whose margins are carinated and which narrows caudad. Abdomen delicately scaly distad, round-ovate (dorsal aspect), its second segment occupying about a fourth of the surface, the region not as long as the thorax. Propodeal spiracle small, round, placed in a boomerang-shaped sulcus. Marginal vein somewhat (about a third) over twice the length of the stigmal, the latter distinctly shorter than the postmarginal. Axillae half advanced into the parapside. Pronotum transverse quadrate. Antennae inserted on a level with the ventral end of the eyes, the scrobes soon uniting and running as a narrow sulcus to the cephalic ocellus. Funicle 1 twice longer than wide, 3 quadrate, as long as the pedicel which is yellowish ventrad. Club 1 somewhat shorter than funicle 3, largest, the third joint terminating in a distinct nipple which appears to be articulated. Genal suture present. Mandibles 7- and 8-dentate.

Described from one female in the collections of the United States National Museum, reared from a cherry "Coleophor," Jamesburg, New Jersey.

Type: Catalogue No. 20225, United States National Museum, the female on a tag, the head, a caudal leg and the antennae on a slide.

Sympiesis massasoit Crawford.

This is a valid species. It differs from *nigrifemora* Ashmead in having the cephalic tibiae black and the other tibiae more or less so.

Aphelinus speciosissimus Girault.

From eggs of *Xiphidium* (?), Richmond, Indiana, W. J. Phillips, 1906.

Aphelinus subapterus new species.

♂. Length, 0.75 mm.; short. Black and scaly, the tips of the tibiae, tarsi and the funicle and club dull yellow. Fore wings very small, only somewhat longer than wide, smoky, with a hyaline cross-stripe at the bend of the submarginal vein, naked, the marginal vein bearing three long bristles, the apex of the wing's blade squarely truncate. Second tooth of mandible truncate. Funicles 1-2 subequal, each a half wider than long, 3 a half longer than wide, longer than the preceding two joints taken together but not half the length of the club, subequal to the pedicel. Scape long and slender. Strigil present. With the generic characters except the wings.

Described from three males labelled *Baocharis marlatti* Ashmead, Riley County, Kansas, May (Marlatt).

Type: Catalogue No. 20226, United States National Museum, two of the specimens in fragments on a slide, a third on a tag.

New Species of Buprestidae (Col.) from the Pacific States,

With Notes Concerning a Few Others.

By Edwin C. Van Dyke, University of California, Berkeley, California.

Of the four insects described below, three have been known to me for a long time, while the fourth was found among a series of Buprestidae collected by Mr. W. J. Chamberlin, in Oregon. The *Anthaxia* bears no close relationship to any of our other Pacific species, but superficially resembles certain forms of *A. quercata* Fab., and may have been what Dr. Horn referred to when he spoke of specimens of that being found in California.[1] It, however, differs entirely as regards its tarsal claws from that species.

The first two species of *Chrysobothris* described are an addition to that large series of species which superficially closely

[1]Revision of the species of some genera of Buprestidae, by George H. Horn, M.D., Trans. Am. Ent. Soc., Vol. x (1882), p. 111.

resemble each other and are so characteristic of the coniferous forests of the western part of our country. They all fall into Dr. Horn's group IV.[2] As regards certain of the species placed in this group, some mistakes were made because of the lack of sufficient material and data. Later, some of these were corrected and the status of a number more definitely outlined in a paper by Mr. H. C. Fall.[3] The two species described by me and mentioned above have, no doubt, if known, always been placed with *C. carinipennis* Lec. Having good series of all three in my hands, I found that I could quite readily separate them and I hope that I have been able to bring out the differentiating points so that others may do likewise.

Anthaxia sublaevis n. sp.

Oblong, moderately depressed; bluish black, beneath slightly greenish, front of head and sides of pronotum somewhat cupreous; front slightly depressed at middle, surface reticulate and clothed with a sparse short silky white pubescence, clypeus slightly projecting and shallowly and broadly incised with a V-shaped incision; prothorax slightly less than twice as wide as long, broader at middle than elytra, sides feebly and regularly arcuate, posterior angles obtuse, disc slightly convex, a slight depression on each side just anterior to basal angles, surface finely reticulate; elytra with sides parallel to posterior third, thence convergent and with slight sinuation to apex, the apices rather broadly and individually rounded and very finely serrate. Surface somewhat shining and with reticulations so planed down that surface is fairly smooth; body beneath more shining than above, the thorax reticulate, the abdomen quite smooth, claws slender and but slightly broader at base. Length, 4 mm.; breadth, 1.25 mm.

This species somewhat resembles and is perhaps closest to *A. viridifrons* Lap., but it is proportionately shorter, smoother, with the apical portion of the elytra more definitely sinuate, and with the clypeus much more broadly and shallowly incised.

My series consists of nine specimens, eight from Tuolumne County, California, collected June 14, 1914, by F. W. Nunenmacher, and one from Shasta County, California, collected

[2]A monograph of the species of Chrysobothris inhabiting the United States, by George H. Horn, M.D., Trans. Am. Ent. Soc., Vol. xiii (1886), p. 84.

[3]On *Chrysobothris californica* and allies, by H. C. Fall, Journ. N. Y. Ent. Soc., Vol. xviii, No. 1, Mch., 1910, pp. 45-52.

many years ago by myself. There is practically no variation.

The type male and female, Tuolumne County, California, June 14, 1914, in my own collection, one paratype deposited with United States National Museum and another with California Academy of Sciences.

Chrysobothris pseudotsugae n. sp.

Form nearly that of *femorata*, sub-depressed with aeneous surface lustre, the punctured spaces of the elytra a greenish bronze, body beneath, legs, antennae, and front a brilliant green; antennae gradually more slender to tip, third joint as long as the next two, front flat with two callosities between eyes, clypeus rather broadly and semicircularly emarginate; thorax with length two-thirds of breadth, sides almost parallel for middle two-thirds, slightly convergent near posterior angles and more convergent and rounded in front, disc moderately convex, a rather shallow though well defined median sulcus densely punctured, an irregular elevation on each side, broader and distinctly defined in anterior half, narrower and illy defined posteriorly, a barely perceptible parallel elevation between this and sides with anterior and posterior portions slightly defined as callosities, the surface otherwise densely and coarsely punctured.

Elytra well rounded at humeri, parallel for middle two-thirds, thence slightly arcuate and convergent to individually rounded and serrate hind angles, disc slightly convex, the sutural costa well defined, broader and flatter in front, narrower and cariniform posteriorly and from middle to apex slightly but perceptibly diverging from suture; the second costa beginning near base in a broad and flat callosity, then interrupted but just anterior to middle continued again but as a narrow elevation to near apex, the third and fourth costae forming irregular and oblique zig-zag elevations; all costae joined by certain irregular flat and transverse elevations, especially in posterior half, depressions all coarsely and densely punctured.

Body beneath smooth and shining, sparsely and coarsely punctate on thorax and sparsely and finely on abdomen, prosternum not lobed in front. Anterior femora with a broad and obtuse tooth, feebly serrate on its outer edge; last ventral with its margin serrulate. Length, 11 mm.; breadth, 4.25 mm.

♂. Prosternum not densely punctured and sparsely pubescent; anterior tibia arcuate, rather abruptly dilated at tip, the dilatation being a lamina arising from the posterior side about one-fourth distance from apex and forming an elongated trapezium; middle tibia less arcuate, gradually broader from apical third to tip, the posterior tibia straight; last ventral segment broadly semi-circularly emarginate, the last dorsal sparsely punctuate with a triangular emargination.

♀. Prosternum more coarsely and more densely punctured; anterior tibia moderately arcuate, gradually wider to tip, the middle less arcuate and gradually wider to apex, the posterior straight; last ventral longer than in male and with a shallow semi-circular emargination; last dorsal more punctuate than in the male and with a small apical notch; the sides of the ventral segments, the tibia, and the front quite cupreous.

This species is probably most closely related to *C. carinipennis* Lec., but it has a decidedly different facies, being less elongate and with the elevated sculpturings of the elytra much

Outline drawings of anterior tibia of males of *Chrysobothris*: 1, *pseudotsugae*; 2, *carinipennis*; 3, *laricis*.

broader and coarser. In *C. carinipennis* Lec. the tibial dilatation in the male is always distinctly longer than broad, at least twice, while in this species it is somewhat less than twice.

My series of twenty-five mounted specimens represents material mainly collected by myself at Carrville, Trinity County, California, June 30, 1913, on Douglas fir, *Pseudotsuga taxifolia* Britt., and from near Fallen Leaf Lake, Lake Tahoe, California, June 2, 1915, on white fir, *Abies concolor* Lindl. & Gord. I have also seen a fair series in the collection of Mr. Ralph Hopping. The species is apparently moderately abundant in Northern California and the Northern Sierras about the trees mentioned, and, no doubt, extends much farther north. It apparently is one of the species which replaces *C. carinipennis* Lec. west of the Cascades and Sierras, the other seeming to be restricted to the Rockies and the northern portion of the Great Basin. Most of the specimens examined are quite constant as to size and their characters, but they

often vary considerably as shown by the fact that I have two females from my first mentioned locality which are very much larger in every way than typical forms, one 13 mm. long and 6 mm. broad, the other 15 mm. long and 7.5 mm. broad.

Type male and female from Carrville, Trinity County, California, June 30, 1913, in my own collection, paratypes deposited in United States National Museum, California Academy of Sciences, and Academy of Natural Sciences of Philadelphia.

Chrysobothris laricis n. sp.

Form and superficial appearance nearly that of *femorata,* sub-depressed, piceous, with aeneous surface lustre, the punctured spaces of the elytra cupreous, body beneath, legs, antennae, and front metallic green passing in places into cupreous; antennae gradually more slender to tip, third joint almost as long as the next two; front flat with two oblique converging callosities between eyes; clypeus rather broadly and slightly angulately emarginate; thorax with length two-thirds of breadth, broadest in front of middle, sides almost straight for middle two-thirds and slightly convergent posteriorly, more acutely near posterior angles, and slightly rounded in front; disc moderately convex, a rather shallow and poorly defined median sulcus densely punctured, the lateral boundaries forming slight callosities only anteriorly, a secondary elevation barely perceptible between this and sides and without callosities, a well defined depression anteriorly near margin, the surface coarsely and densely punctured.

Elytra well rounded at humeri, gradually and but slightly arcuately widening to posterior two-thirds, thence slightly arcuate and convergent to individually rounded and serrate hind angles; disc slightly convex, the sutural costa poorly defined anteriorly but well marked for posterior three-fourths and from middle backwards at first gradually diverging from suture then more widely and arcuately separating and toward apex rather suddenly approaching again; the second and third costae irregular, somewhat flattened in places and interrupted, the fourth narrow, moderately well defined and near margin, all costae more or less joined by various short cross bands, two well defined slightly oblique and irregular transverse depressions, one slightly in front of middle and the other midway between this and apex, simulating closely those so generally seen in *Chrysobothris femorata* Fab.; all depressions coarsely and densely punctured.

Body beneath shining, densely punctured and pubescent on thorax, more sparsely punctured on the abdomen, prosternum not lobed in front. Anterior femora with a broad and obtuse tooth, feebly serrate on its outer edge; last ventral with its margin serrulate. Length, 11 mm., breadth, 4.5 mm.

♂. Prosternum densely and finely punctured and rather densely pubescent;; anterior tibia arcuate, somewhat suddenly constricted at junction of middle with outer third, then abruptly dilated, the dilatation being a lamina arising from the posterior side which forms an arcuate enlargement that is distinctly constricted apically; middle tibia less arcuate, gradually broader to tip, the posterior tibia straight; last ventral segment broadly semi-circularly emarginate, the last dorsal sparsely punctate at middle, more densely at sides and with a triangular emargination.

♀. Prosternum more coarsely and sparsely punctured and sparsely pubescent; anterior tibia moderately arcuate, gradually wider to tip, the middle almost straight and slightly wider toward tip, the posterior straight; last ventral longer than in male and with a small semi-circular emargination, last dorsal more punctate at middle than in the male and with a small apical notch; the under surface, head, antennae, and legs being more cupreous than in the male.

This species superficially has the facies of *C. femorata* Fab. and because of the greenish under surface and head, especially in the male, might be confused with *C. carinipennis* Lec. and *C. pseudotsugae*. It, however, differs from the latter two as regards the prosternal characters of the male as well as the type of tibial dilatation. Among the Pacific species, it would, according to its characters, come closest to *C. sylvania* Fall, but it has quite a different facies and besides has a different type of male tibial dilatation. In fact the only western species which has the same type of male tibial dilatation is *C. caurina* Horn, a species which belongs in the series possessing a lobed prosternum.

My series contains eleven specimens, nine collected on the western larch, *Larix occidentalis* Nutt., and one on the lodge pole pine, *Pinus contorta* var. *murrayana* Balf., in Grant County, Oregon, during various days in July, 1914, by Mr. W. J. Chamberlin, and one collected by Mr. E. P. Van Duzee at Angora Lake, near Lake Tahoe, California, July 7, 1915, presumably on the lodge pole pine. I have also examined another and even greater series of specimens collected by Mr. Chamberlin which is now at the Oregon Agricultural College. This species seems to belong in the northern part of the Great Basin and normally on the larch and lodge pole pine, and to

have followed the last in its distribution down through the high altitudes of the Cascades and Sierras. The specimens examined are also quite constant as to size and characters.

Type male and female from Grant County, Oregon, July 22 and 23, 1914, in my own collection, paratypes deposited in United States National Museum, California Academy of Sciences and Academy of Natural Sciences of Philadelphia.

Chrysobothris mali var. **lineatipennis** n. subsp.

The more typical form of *C. mali* Horn which ranges throughout the Pacific States, though to a certain degree variable as are all of the species of the genus, still preserves a general facies and constancy of characters which enables it to be readily recognized. In the essential characters such as the slightly lobed prosternum, the usual feebly developed median sulcus of the pronotum, the disc without defined callosities, and the form of tibial dilatation in the male, this subspecies resembles it. It, however, differs in being generally smaller, 7 mm. in length as against the usual 8 or 9 mm., in being narrower and more parallel, more brilliantly cupreous and shining, with the head and pronotum excessively brilliant and contrasting with the elytra, as against a duller bronze and more uniform coloration, in the upper surface being without the usual sparse pubescence, in having all of the elytral costae more definitely elevated and defined, the second and third only slightly interrupted, in having the clypeal excavation more acute and with the sides not rounded externally, the anterior femoral tooth more acute, and the anterior tibial dilatation of the male but slightly developed as against the well developed dilatation in typical forms.

This insect I have for some time been considering as a distinct species, but upon further study find that I cannot consider it as anything more than a well marked and somewhat local subspecies. Its brilliancy, lack of pubescence, and costate elytra will enable it to be readily separated from the typical form.

Four specimens, a male and three females, in my own collection, collected in 1887 in the Santa Monica hills near Santa Monica, California, critically examined. Several others have been seen.

Type male and paratype in my own collection.

Chrysobothris cyanella Horn.

A good series of this beetle collected under the same conditions and in the same locality, the Kings River, in the South-

ern Sierras, shows that it varies in color from a brilliant blue green through bronze green to cupreous. In the middle Sierras and north, it is more apt to be of a bluish green and somewhat constant. It is generally to be found in the flowers of a species of wild white buckwheat, *Eriogonum*.

Chrysobothris dentipes Germ.

This species Dr. Horn had not seen from California. It is, however, very common in the northern counties of the State where it may be seen about the dead trunks and larger limbs of the western yellow pine, *Pinus ponderosa* Dougl.

Chrysobothris silvania Fall.

This species, first found by L. E. Ricksecker in northern Sonoma County, has been since found by F. W. Nunenmacher in Del Norte County, California, and by J. C. Bridwell and W. J. Chamberlin on Mt. Jefferson, Oregon.

New North American Gall Midges (Dipt.)

By E. P. Felt, Albany, New York.

This paper includes descriptions of recently characterized forms, one of the most interesting being the *Retinodiplosis* reared from the cones of Bald Cypress. In this connection it appears desirable to place on record, the capture by Dr. W. L. McAtee, April 12, 1914, on Plummer's Island, Maryland, of additional specimens of *Neocatocha marilandica* Felt, a species first taken by this collector in the same locality almost exactly seven years earlier. The female has been described and the male is still unknown.

Asynapta marilandica n. sp.

The species described below runs in our key to *A. cerasi* Felt, from which it may be easily separated by the pulvilli being distinctly shorter than the claws. The male was received from Dr. E. W. Nelson, labeled Plummer's Island, Maryland, August 17, 1912, Dr. W. L. McAtee, collector.

♂. Length 1.5 mm. Antennae longer than the body, thickly long-haired, yellowish brown; 23 segments, the fifth with a stem three-fourths the length of the subcylindric basal enlargement, which latter has a length about one-half greater than its diameter; terminal seg-

ment reduced, irregular. Palpi: first segment subquadrate, the second with a length three times its diameter, the third longer and stouter than the second, the fourth one-half longer than the third, irregular, somewhat capitate.

Mesonotum light yellowish brown. Scutellum, postscutellum and abdomen mostly light yellowish. Halteres yellowish white. Coxae pale yellowish. Legs mostly light straw; claws moderately stout, strongly curved, unidentate, the pulvilli shorter than the claws.

Genitalia, yellowish brown; basal clasp segment rather long, stout; terminal clasp segment moderately stout, recurved apically; dorsal plate divided, the lobes moderately broad, broadly rounded and sparsely setose apically; ventral plate shorter, the lobes narrow, obliquely truncate apically.

Type: Cecid. 1660.

Dasyneura lupini n. sp.

The galls from which this species was reared were collected by Mr. L. H. Weld at Buena Vista Park, San Francisco, California, August 25, 1915. They occurred on a perennial species of *Lupinus* which was shrubby at the base, much branched, 2 to 4 ft. high and perhaps *Lupinus propinquus*. The galls were kept outdoors by Mr. Weld and a lot forwarded to the writer early the following May from which specimens of both sexes were obtained May 10. The male of this species runs in our key to *D. meliloti* Felt, from which it may be separated by differences in the genitalia, especially in the shape of the lobes of the dorsal plate. The female of this Lupine species is remarkable for the very long lobes of the ovipositor.

Gall. Irregularly fusiform, presumably stem gall, light green when fresh, fleshy, quite firm, polythalamous, the interior fibrous and inhabited by a number of larvae; length, 1.5 to 2.5 cm.; diameter, 1 to 1.5 cm.

Cocoon. Oval, length about 2 mm., rather firm in texture and light yellowish.

♂. Length, 1.75 mm. Antennae about as long as the body, thickly haired, reddish brown; 16 or 17 segments, the fifth with a stem three-fourths the length of the cylindric basal enlargement, which latter has a length about one-half greater than its diameter and a moderately thick whorl of long, stout setae; terminal segment slightly produced, narrowly oval, with a length about twice its diameter. Palpi: first segment irregularly quadrate, the second a little longer, more slender, the third one-half longer than the second, more slender, the fourth one-half longer and more slender than the third.

Mesonotum dark red, the submedian lines sparsely haired. Scutellum and postscutellum dark reddish brown. Wings hyaline, the third vein nearly straight. Coxae dark brown; legs mostly a brownish straw, the tarsi somewhat darker; claws long, unusually slender, the pulvilli about as long as the claws.

Abdomen sparsely haired, the sclerites dark brown, the incisures and pleurae fuscous yellowish. Genitalia fuscous yellowish; basal clasp segment stout, tapering; terminal clasp segment short, tapering; dorsal plate deeply and narrowly incised, the lobes tapering slightly to a narrowly rounded apex; ventral plate moderately long, broad, deeply and roundly emarginate, the lobes slender, tapering and sparsely setose apically.

♀. Length, 2.5 mm. Antennae extending to the base of the abdomen, sparsely haired, dark reddish brown; 17 subsessile segments, the fifth with a length three-fourths greater than its diameter; terminal segment reduced, narrowly oval. Palpi: first segment irregularly oval, the second subquadrate, the third one-half longer than the second, more slender, the fourth one-half longer than the third, more slender.

Mesonotum reddish brown or dark brown, the submedian lines sparsely haired. Scutellum and postscutellum dark reddish. Halteres mostly yellowish. Coxae dull yellowish; legs mostly dark brown.

Abdomen sparsely haired, dark brown, the incisures and pleurae reddish orange. Ovipositor as long as the abdomen, the terminal lobes sparsely haired, narrow, with a length about six times the width.

Type. Cecid. a2723.

Asphondylia shepherdiae n. sp.

The midges described below were reared from a bud gall on *Shepherdia canadensis,* collected June 27, 1914, by Prof. E. Bethel, at Lake Eldora, Colorado. The species runs in our key to *A. sambuci* Felt, from which it is most easily distinguished by the pale yellowish legs. It is easily separated from the western *A. diplaci* Felt by the distinctly narrower wings.

Gall. This is a globose, thin-walled, yellowish green, bud gall, variably spotted with reddish, and having a diameter of 4 to 5 mm.

Exuvium. Length, 4 mm., cephalic horns and the dorsum of the thorax mostly yellowish, the remainder of the body dark brown, the terminal segment being lighter. The dorsum of the abdominal segments with a transverse row near the posterior third, of moderately long, stout spines, and from the middle to the anterior third, an irregular series of three or four rows of smaller, similar spines; terminal

segment with two latero-posterior diverging, triangular spines and an irregular arc extending from one of these groups to the other and composed of approximately nine smaller, though stout spines, the basal portion of the terminal segment with an irregular series of similar though somewhat smaller spines.

♂. Length, 3 mm.. Antennae nearly as long as the body, sparsely haired, dark brown; 14 segments, the third with a length five times its diameter, the terminal segment somewhat reduced, with a length four times its diameter. Palpi: the first segment quadrate, the second with a length more than twice that of the first, the third more slender and one-half longer than the second. Mesonotum slaty brown. Scutellum and postscutellum brownish red. Halteres fuscous yellowish Coxae dark brown; legs mostly pale yellowish; claws stout, strongly curved, the pulvilli as long as the claws.

Abdomen dark brown. Genitalia: basal clasp segment short, very broad; terminal clasp segment short, stout; dorsal plate divided, the lobes triangular, the inner margins broadly rounded and setose; ventral plate suborbicular, deeply and roundly emarginate posteriorly, the lobes narrowly rounded apically.

♀. Length, 3 mm. Antennae nearly as long as the body, sparsely haired, dark brown; 14 segments, the third with a length six times its diameter; terminal segment with a length three-fourths its diameter. Palpi: first segment subquadrate, the second with a length about twice that of the first, the third more slender, with a length about one-fourth greater than the third.

Mesonotum slaty brown, the submedian lines sparsely haired. Scutellum and postscutellum reddish brown. Halteres yellowish white. Coxae dull reddish, the legs mostly fuscous yellowish; claws stout, strongly curved.

Abdomen dark reddish brown. Ovipositor about as long as the abdomen.

Type. Cecid. a2550.

Retinodiplosis taxodii n. sp.

A number of midges tentatively referred to this genus were reared April 27, 1916, by Mr. George W. Barber, Charleston, Missouri, from cones of Bald Cypress, *Taxodium distichum.* The food habits, as well as certain structural characteristics serve to distinguish this species from related forms. This gall was also collected November 14, 1910, by Dr. W. L. McAtee at Mud Lake, Arkansas, though no adults were reared.

Gall. This is an irregular, thick-walled, somewhat spongy, usually monothalamous gall with a diameter of 5 to 7 mm., which occurs

tightly packed in Cypress cones. These galls are evidently modified seeds and the shape is determined to a great extent by the growth of those adjacent.

Larva. Length, 3 mm., moderately stout, yellowish white or yellowish orange. Head short, broad, the antennae short, tapering, apparently uniarticulate; breastbone distinct, brown, with anterior and posterior, somewhat crescentic prolongations, the former bidentate, the teeth being widely separated and sublateral; skin coarsely shagreened, posterior extremity broadly rounded.

Pupa. Length, 4 mm., stout, mostly reddish orange, the thoracic horns slender, tapering, light brown, with variable fuscous markings, the antennal horns short, stout, obtuse, the antennae hardly extending to the base of the abdomen, the wings to the third abdominal segment, and the leg to the fourth abdominal segment, the last three in nearly mature pupae, black; posterior extremity obscurely lobed, rounded.

♂. Length 2 mm. Antennae a little longer than the body, rather thickly haired, fuscous yellowish; 14 segments, the fifth having the stems with a length one and one-half and two and one-half times their diameters, respectively; the distal enlargement with a length one-half greater than its diameter and a distinct constriction near the basal third; circumfili moderately stout, the loops numerous, the distal filum having 16 to 20. Palpi: first segment subquadrate, the second one-half longer, more slender, the third as long as the second, more slender, the fourth one-half longer than the third, somewhat dilated.

Mesonotum fuscous yellowish, the submedian lines yellowish. Scutellum and postscutellum reddish orange. Halteres whitish transparent, yellowish apically. Coxae, femora and tibiae mostly pale yellowish, the tarsi with the most of the second segment, the third and fourth pinkish, the remainder fuscous yellowish; claws moderately slender, somewhat curved, the pulvilli about half the length of the claws.

Abdomen with deeper red, the lateral margins rather thickly clothed with short, fuscous hairs. Genitalia fuscous; basal clasp segment stout; terminal clasp segment moderately stout, long, strongly curved; dorsal plate deeply and triangularly emarginate, the lobes somewhat divergent, broadly and irregularly rounded; ventral plate broad, somewhat spatulate, broadly and roundly emarginate, both thickly setose.

♀. Length 4 mm. Antennae extending to the fourth abdominal segment, sparsely haired, reddish; 14 segments, the fifth with a stem one-fourth the length of the cylindric basal enlargement, which latter has a length four times its diameter, the circumfili at the basal third and apically, stout and rather high; terminal segment somewhat produced, with a length five times its diameter and a knob-like process apically. Palpi: first segment roundly subquadrate, the second with a length nearly twice the first, the third a little shorter than the second, more

slender, the fourth almost twice the length of the third, more slender.

Mesonotum fuscous yellowish, the submedian lines yellowish-orange. Scutellum and postscutellum reddish orange, the former somewhat fuscous. Halteres mostly whitish transparent, pale orange distally. Legs mostly a pale yellowish orange.

Abdomen deep reddish orange, irregularly fuscous basally; ovipositor yellowish, short, the lobes with a length about three times the width, narrowly rounded apically and thickly setose.

Type Cecid. a2722.

This species presents in both sexes, many characters in common with typical species of *Retinodiplosis* and is noteworthy because the larva has no chitinized tubercles supporting the posterior spiracles. This latter is evidently a modification resulting from environmental necessities and would hardly be expected to appear in a species inhabiting seeds and not occurring more or less submerged in a pitchy medium.

A new Cratomus (Hym.).

By T. D. A. Cockerell, Boulder, Colorado.

The remarkable Pteromalid genus *Cratomus* was founded by Dalman in 1820 for *Cynips megacephala* of Fabricius, which occurs in northern and central Europe. Two years later Dalman wrote the name *Caratomus*, the original form having been, we may suppose, due to a misprint or slip of the pen. It is a question which to maintain; but Ashmead, in his Classification of Chalcid Flies, returned to the original spelling, *Cratomus*.

A second species of the genus was described from Britain in 1833 by Walker; and in 1888 Ashmead described another, *C. leucophthalmus*, from a specimen collected by Fletcher on a window in Ottawa, Canada. In May of this year I found a specimen on a window in my house in Boulder, Colorado, and as it is evidently distinct from the Canadian species, it may be described as follows:

Cratomus cancellatus n. sp.

♂. Length about 2.5 mm., robust, with the extraordinary head characteristic of the genus. It differs from *C. leucophthalmus* Ashm. as follows:

General color pure black on head and thorax, perhaps a slight metallic (bluish) tint at sides; head and thorax minutely cancellate; eyes wholly dark; antennæ black or almost so, the scape above and club at end reddish; legs black, the anterior tibiæ clear red, all basitarsi pallid reddish; central blotch of wings very dilute, not very conspicuous.

The eyes are hairy; face with strong striae converging toward mouth; mandibles dark red, with very large triangular teeth, 3 on left mandible, 4 on right. The following measurements are in microns: width of head, about 1250; width of antennal club, 112; length of submarginal vein, 830; marginal, 240; stigmal, 208; postmarginal, 270. The submarginal vein is longer in proportion to the marginal than Ashmead indicates for his species.

Type in the writer's collection.

An Easy Method of making Insect Labels.

By R. H. Beamer, the University of Kansas, Lawrence, Kansas.

The inconvenience of printer's labels has led to the adoption of photographed labels in the Entomological Collections in the University of Kansas. The photographed labels have the advantage of being smaller and less expensive than those made at the print shop. The printed labels formerly used were 8x18 millimeters in size while the labels now used are commonly half that size. The advantage of the small labels is very apparent when the two sizes are seen in cases of small insects.

The labels are first written out with a typewriter on white paper of good quality so that the ink will not blur. The machine should have a black record ribbon to give the type as strong contrast as possible on the white paper. Locality labels are written in rows, two spaces being left between each two labels and between each two rows of labels. When the page is full it is then photographed to any size desired.

When material has been determined by a specialist it is very important that these determinations be preserved. This is accomplished by placing upon each individual specimen a small label bearing the generic and specific name, the name of the describer of the species and the name of the specialist who has determined it. These labels are made in the following manner:

The part of the label (Det. by —— ——) as it is uniform throughout is written on the typewriter. The scientific names, however, are so variable in size that they must be printed in by hand with india ink. Two spaces are left between the labels and at least four spaces between the rows of labels. When the sheet is filled with labels it is placed on a drawing board and two lines one-eighth inch apart drawn between the labels both horizontally and vertically with india ink. This facilitates the cutting out of the labels when they are finished and the black around the border adds to the neatness of their appearance. When the names of the insects have been printed in the rectangular spaces made by the ruling, the sheet is ready to be photographed.

Duplicate specimens of the same species are taken care of very nicely. An estimate is made of the number of prints to be made from the sheet in question and the number of duplicate labels will be governed accordingly. For example, if there are a hundred specimens of one species and twenty of another and the negative is to be printed twenty times, five labels would be made of the one species and but one of the other. The number of prints made from one label sheet will necessarily depend upon individual cases.

The best photographic results have been obtained with Cramer's Contrast Plates developed by the formula enclosed with the plates. Contrast Cyko No. 6 is used in printing.

It is needless to add that the labels must be very thoroughly fixed and washed in order to insure permanency.

Tenthecoris bicolor Scott. in New Jersey Greenhouses (Hemip.). This blue and red member of the family Miridae is occasionally met with in New Jersey greenhouses where orchids are grown and has been taken at various times by inspectors examining orchids from South America. It is a common occurrence to find the leaves of Cattleya orchids imported from Brazil sometimes covered with irregular white spots due to the abstraction of chlorophyll by these bugs. As a rule, it is never abundant enough in New Jersey greenhouses to do much damage, although it has been known in the past to occur in numbers sufficient to seriously weaken and disfigure the orchids. It is incorrectly known to many orchid growers as the Brazilian thrips. Additional notes on this species and its introduction into England can be found in the *Gardeners' Chronicle* for May 16, 1908.—HARRY B. WEISS, New Brunswick, New Jersey.

Notes on Zonocerus elegans Burm. (Orthop.)

By Stephen G. Rich, Adams Institute, Amanzimtoti, Natal, South Africa.

Zonocerus elegans Burm. is a very common Acridid in the coast and central districts of Natal. It is 1½ to 2 inches long; the abdomen is very thick, in both sexes.

This animal shows "flash coloration" in a most interesting way. Its blood and saliva both possess an extremely disgusting odor, not unlike that of the skunk in America, but less penetrating. Both these fluids are irritating to the skin and mucous membrane. The abdomen of *Z. elegans* is bright yellow, the wings vermilion to Indian red, the prothorax gray-green, and the head black-and-orange mottled. The antennae show alternate bands of black and orange, and the eyes are dark red.

These animals are exceedingly conspicuous, and gather on dry, sunny, open places, especially on hard roads. Fowls, birds, etc., do not touch them at all. So thoroughly protective is this coloration that, when disturbed, *Zonocerus* does not even jump far, but hops perhaps ten inches. Repeated urging will produce a jump of some three feet at most.

The wings are not functional. About a third of the males and a tenth of the females have wings of usual size, which they flutter when jumping: but these do not jump any farther or better than the common forms. The more usual form in both sexes has wings not over half an inch long, which are never moved. A few forms with wings of intermediate size are found in both sexes, but more often in the male.

That none of these are nymphal is shown by their all being found in copulation. The various forms copulate with each other freely, and quite as often with those of different-sized wings as with those of like wings.

Copulation takes place in March and April, and oviposition, in the ground, occurs at once. The male remains on top of the female during oviposition. The females die immediately after oviposition and the males a little later. The earliest nymph I

have seen was about May 5. There are two generations a year. The nymph is yellow, with black longitudinal stripes, and lacks the bad odor for three instars; its coloring is protective. As adult form is approached, the adult color and odor are assumed. The last nymphal instar has black wing-pads.

Zonocerus is a garden pest and also on sugar cane. The natives (Zulus) call it "intotoviyana": the commonest names among Europeans are "Totoviana" and "Soldier Grasshopper."

No control seems to be known: I have detected red hymenopterous eggs and larvae under the wings in a few specimens.

Ants Caught on a Trip to California (Hym.).

By Hazel Andrews, University of Colorado, Boulder, Colorado.

During the summer of 1915, in company with Professor and Mrs. T. D. A. Cockerell, of the University of Colorado, I went to the California Exposition. Interesting as the trip itself was it took on an added interest because it gave me an opportunity to add to my collection of ants. Of all insects, ants are the most easily collected on a railway journey, because they are usually to be found around the stations and along the tracks. The collecting facilities are simple, all that is necessary being small bottles of alcohol and a note-book for data concerning locality and habitat. Many an otherwise tiresome delay may be made interesting by hunting near the tracks for ants.

Such a collection may not add anything new to science but it certainly adds to one's knowledge of the general distribution of various genera, as in this case of *Pogonomyrmex*. With the new forms it is possible to make more comparisons and to realize better the relationship between species and genera. This trip was not primarily a myrmecological expedition but the following list shows what a good collection can be acquired with only a little effort.

Dr. W. M. Wheeler has kindly examined the list and confirmed the identification of a number of the specimens.

MYRMECINAE.

Monomorium minutum ergatogyna Wheeler. Coronado Island, Mexico (T. D. A. Cockerell); Berkeley, California (Hazel Andrews.)

Solenopsis geminata maniosa Wheeler. La Jolla, California. (H. A.)

Pheidole grallipes Wheeler (*longipes* Pergande). Coronado Island, Mex. (T. D. A. C.); La Jolla, Calif. (H. A.)

——**hyatti** Emery. Avalon, St. Catalina, California. (H. A.)

Crematogaster lineolata Say. var. La Jolla, Calif. (H. A.)

Messor andrei Mayr. Coronado Island, Mex. (T. D. A. C.); La Jolla, Calif. (H. A.); Long Beach, California (H. A.)

Pogonomyrmex barbatus fuscatus Emery. Lamy, New Mexico. (T. D. A. C.)

——**barbatus marfensis** Wheeler. Los Cerillos, New Mexico (T. D. A. C.)

——**barbatus rugosus** Emery. Goffs, California (T. D. A. C.)

——**occidentale** Cresson. Las Vegas, New Mexico (H. A.); Wells, Nevada (H. A.); Raton, New Mexico (H. A.); Seligman, Arizona (H. A.)

——**subdentatus** Mayr. Long Beach, Calif. (H. A.)

——**californicus** Buckley. Long Beach, Calif. (H. A.); Needles, California (H. A.); Glendale, California (T. D. A. C.); Pasadena, California (H. A.)

DOLICHODERINAE.

Liometopum apiculatum occidentale Emery. Orange County Park, California (H. A.)

——**apiculatum luctuosum** Wheeler. Lamy, New Mexico (H. A.)

Dorymyrmex pyramicus Roger. Lookout Mountain near Los Angeles, California (T. D. A. C.); Glendale, California (T. D. A. C.); Albuquerque, New Mexico (H. A.)

Dorymyrmex pyramicus bicolor Wheeler. Kingman, Arizona (H. A.)

Tapinoma sessile Say. Lookout Mt., California (T. D. A. C.); La Jolla, California (H. A.)

Iridomyrmex humilis Mayr. (Argentine ant). Long Beach, California (H. A.); Avalon, Sta. Catalina (H. A.); La Jolla, California (Dr. F. B. Sumner); San Diego, California (H. A.); Berkeley, California (H. A.); Pasadena, California (H. A.)

CAMPONOTINAE.

Formica rufa aggerans Wheeler. Kaw, Nevada (W. P. Cockerell).

——**rufibarbis occidua** Wheeler. Nigger Slough, Los Angeles County, California (T. D. A. C.); Palo Alto, California (H. A.); Berkeley, California (H. A.).

——**rufibarbis guava** Buckley. Albuquerque, New Mexico (H. A.)
——**subpolita camponoticeps** Wheeler. Mt. Tamalpais, California (T. D. A. C.)
——**cinerea pilicornis** Emery. Glendale, California (T. D. A. C.).
——**(Proformica) neogagates** Emery. Wells, Nevada (H. A.).
Myrmecocystus melliger lomaensis Wheeler. La Jolla, California (H. A.).
Camponotus maculatus plorabilis Wheeler. Between Valley Pass and Moor, Nevada (H. A.).

New Lepidoptera from South America.

By LEVI W. MENGEL, Reading, Pennsylvania.

Catagramma horstii n. sp.

Expanse 43 mm. Primaries black with bluish reflection toward the apex. Base of wing, through discoidal cell, red. From the costa, a red band extends across the wing, almost to the inner angle. There is a thin orange band in the apex. The exterior margin has a broken white edging.

The secondaries are black, along the anterior portion, shifting to dark blue toward the exterior margin. A red bar projects from the base through the discoidal cell. The entire wing has a broad white unbroken margin. Antennae and upper part of body, dark brown.

Under side in general as in the other of the *sorana* forms. The solid white margin of the inferior wing is as pronounced as on the upper side.

Described from two specimens from Cavinas, Bolivia.
Type.—Academy of Natural Sciences of Philadelphia.
Paratype.—Collection Mengel.

Perisama inconspicua n. sp.

Expanse 42 mm. Upper sides in general as in the species of the *humboldtii* group. The marginal blue band of the inferior wings is much nearer the margin of the wing than in *humboldtii*, and is more inclined to gray in color. Under side of primary wing shows no red whatever. The base is buff and covers the discal cell. Along the costa a narrow blue band extends from the cell to the white diagonal spot, which appears midway in the wing, and points to the angle. This white spot terminates in a blue edging. Apex broadly yellow, with a few isolated white marks on the edge. Balance of wing black.

Secondary wings solidly buff. A black bar extends from the middle of the anterior margin almost to the angle. Another black bar passes from the anterior surface, parallel with the external margin, to the

inner angle. There is a row of 5 black spots in the wing between the bars. Body on upper part black, gray beneath.

Described from two specimens from Chaochi, U. S. of Colombia.

Type.—Academy of Natural Sciences of Philadelphia.

Paratype.—Collection Mengel.

Coleophora laricella Hübn. in New Jersey (Lep.).

This insect, known as the Larch Case Bearer and recorded from Rutherford, N. J., (Ent. News, vol. XXVII, p. 13), does not seem as yet to have a very extensive distribution in New Jersey. It was evidently introduced on imported nursery stock as it has a wide distribution in continental Europe and hundreds of cases of stock are consigned to Rutherford every year. The larvae mine the distal halves of the larch needles and later construct cases in which they live while feeding during the remainder of the season, these cases later being fastened to stems and twigs and serving as a protection for the larvae while overwintering. The injury to the tree is very apparent in the discoloration, shriveling and withering of the tips of the needles. In the spring, growth is completed and pupation takes place. Quite extended accounts of this species can be found in F. V. Theobald's Report on Economic Zoology for year ending April 1st, 1905, S. E. Agric. Col. of Wye.; Felt's work on *Insects Affecting Park and Woodland Trees* and in Bull. 322 of the Cornell Agric. Exp. Sta.—HARRY B. WEISS, New Brunswick, New Jersey.

The House Cricket a Pest in St. Louis (Orth.).

I beg to make a report on the House Cricket (*Gryllus domesticus*) which is a house pest at the present time (Sept. 1, 1916) in North St. Louis, Missouri. I investigated and found them by the hundreds in private homes, and in one store by the thousands, eating the labels off the canned goods, and eating paper bags and other goods, even clothing. I have always noticed them in the yard and even in the house for the last fifteen years, but this is the first time I noticed them by the thousands. I enclose a clipping of a report of one of our evening papers on the pest, and hope this will prove of interest to the NEWS.—CHARLES L. HEINK.

[The clipping enclosed is from the *St. Louis Times* for August 23, 1916, as follows:]

A new bug pest, a cross between a grasshopper and a cricket, with the appetite of a goat, inasmuch as it devours clothes and paper, is pestering residents in Northeast St. Louis, and they have issued an appeal to the police and health departments to aid them in their efforts to destroy the insects.

Jacob Weinberg, proprietor of a store, 4337 North Broadway, was the first to appeal to the police. He said the insects invaded his place of business, ate holes in clothing and paper bags.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., NOVEMBER, 1916.

How Knowledge of Insects Grows.

We have been looking up the literature on the natural history of Costa Rica recently, with results which, we hope, will appear shortly in another place. A couple of incidents in our search may be not inappropriately mentioned in our monthly editorial. In 1901 Prof. Cockerell wrote of the scale insect, *Aspidiotus articulatus,* that it was the first Coccid reported from Costa Rica, "not one Costa Rica record" in the *Biologia Centrali-Americana.* The passing of the years enabled him and a coadjutor to describe, in 1915, a new species, *Eriococcus costaricencis,* from twigs of *Vaccinium* with much black fungus, Mt. Irazú, Costa Rica, 11,300 feet, and to add the comment that this form "comes from the highest altitude yet known for a Coccid."

The Volcano Irazú has a crater nearly a mile in diameter, containing in turn daughter- and grand-daughter-craters, all inactive for many years. Its great bowl is mist-filled for much of the time and as a result is often gaily decked with flowers and inhabited by a variety of insects. There is no reason why scale-insects should not thrive there and these two bits of historical entomology afford but one more instance of our lack of knowledge of much of insect life.

Questions and Answers.

The NEWS invites those having any entomological questions which they wish answered to send such in for publication under this heading, and also invites answers from its readers or others to these questions. Questions and replies should be as brief as possible and the Editors reserve the right not to publish any of either class which seem to them objectionable or inappropriate. Those sending in contributions to this department will please indicate whether they wish their names or merely one or more initials to appear in connection with their communications, but all such must be accompanied by the full name and address of the writer for the information of the editors.

ANSWER TO QUESTION No. 1 (October, 1916, News, p. 371).—The matter of mounts for insects such as mentioned by "C" in the last "News" interests me. That I approve of protective mounts is undoubted, as I have long practiced the placing of types of fragile insects in mounts for their protection. But the best mounts for the

purpose I have found are the so-called Riker mounts. This type of mount does not permit one to see both sides of the insect but allows the removal of the top for a more careful examination of all parts of the specimen. If the above mentioned writer, "C," has a better mount I would be interested to receive a sample.—A. N. CAUDELL, U. S. National Museum, Washington, D. C.

QUESTION No. 2.—I wish to ask the opinion of entomologists as to which is the best way to keep overwintering pupae that pupate in the ground. Should they occasionally be moistened and if so how often? —H.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Argyresthia thuiella Pack. in New Jersey (Lep.).

This species, known as the Arbor vitae leaf miner, has a much more extended distribution in New Jersey than is generally supposed. Smith in his Cat. Ins. of N. J., p. 554, lists it only from Essex Co., (Kf.). As a matter of fact, it occurs in many of the large nurseries in the northern part of the state and is undoubtedly being further distributed by them. The larvae mine the terminal sprays, the tips of which eventually turn brown. In severe infestations, which however appear to be rare, the foliage has a rusty, brownish appearance, detracting much from its ornamental use. Light infestations escape the attention entirely of most nurserymen, who assume that the discolored tips are due to root troubles or adverse weather conditions.—HARRY B. WEISS, New Brunswick, New Jersey.

Agrilus viridis L. in New Jersey (Col.).

An account of the occurrence of this member of the family Buprestidae in New Jersey and its damage to *Rosa rugosa* can be found in the *Jour. Econ. Ent.*, Dec., 1914. Inasmuch as I said nothing in this account concerning its life history, it might be well to state that Theobald in his bulletin on *The Animal Pests of Forest Trees,* gives beech, alder, birch, aspen and oak as food plants and states that the adults appear in June and July and fly in bright sunshine. Eggs are deposited singly on the bark near the ground and the larvae live under the bark, boring in the sap wood and into the wood itself, living in the trees for two or three winters and pupating in April or May. It attacks healthy as well as unhealthy saplings. Its long larval period makes it an unsatisfactory insect to breed out in the laboratory and accounts for the few adults which I obtained from many infested stems. It was evidently introduced into New Jersey in woody roses or shade trees imported from Europe.—HARRY B. WEISS, New Brunswick, New Jersey.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico are given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

2—Transactions of the American Entomological Society, Philadelphia. **3**—The American Naturalist. **4**—The Canadian Entomologist. **5**—Psyche. **6**—Journal, New York Entomological Society. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **68**—Science, New York. **87**—Bulletin, Societe Entomologique de France, Paris. **102**—Proceedings of the Entomological Society of Washington. **105**—Videnskabelige Meddelelser, Naturhistoriske Forening i Kjobenhaven. **159**—Bollettino, Laboratorio di zoologia generale e agararia della R. S. Superiore d'Agricoltura in Portici. **161**—Proceedings Biological Society of Washington. **179**—Journal of Economic Entomology. **195**—Bulletin, Museum of Comparative Zoology, Cambridge. **204**—New York State Museum, Albany. **304**—Annals of the Carnegie Museum. **324**—Journal of Animal Behavior, Cambridge. **399**—Proceedings of the Cambridge Philosophical Society, Cambridge, England. **447**—Journal of Agricultural Research, Washington. **450**—Ohio State University Bulletin, Columbus. **518**—Tennessee, Agricultural Experiment Station of the University, Knoxville. **519**—The Scientific Monthly, Lancaster, Pa. **536**—Journal, Bombay Natural History Society. **537**—Proceedings, Entomological Society of Nova Scotia, Truro. **538**—Lorquinia, Los Angeles.

GENERAL SUBJECT. Allen, E. C.—Protective coloration, **537**, i, 78-84. **Kermode, F.**—Report of the Provincial Museum (British Columbia) of Nat. History for the year 1915. Entomology, pp. 16-18. **Matausch, I.**—Obituary note by R. W. Miner, **6**, xxiv, 155-7. **May, R. M.**—Insect collecting in the San Bernardino range, **538**, i, 11. **Osborn, H.**—Agricultural entomology for students, farmers, fruit-growers and gardeners. 347 pp. illus. (Lea & Febiger, 1916). **Swaine, J. M.**—Eighth annual report of the Quebec Society for the protection of plants from insects and fungous diseases, 1915-16. 116 pp. **Webster, F. M.**—Obituary by L. O. Howard, **102**, xviii, 79-83. **Weiss, H. B.**—The insect fauna of N. Jersey greenhouses, exclusive of the Coccidae, **6**, xxiv, 144-50. New Jersey insects, **519**, iii, 385-88.

PHYSIOLOGY AND EMBRYOLOGY. Doncaster, L.—On some gynandromorphic specimens of Abraxas grossulariata, **399**, xviii, 227-9. **Metz, C. W.**—Additional types of chromosome groups in the Drosophilidae, **3**, l, 587-99. Linked mendelian characters in a new species of Drosophila, **68**, xliv, 431-2.

ARACHNIDA, ETC. **Petrunkevitch, A.**—The shape of the sternum in scorpions as a systematic and a phylogenetic character, **3,** 1, 600-8. **Silvestri, F.**—Contribuzione alla conoscenza degli Stemmuiloidea, **159,** x, 287-347.

NEUROPTERA, ETC. **Ferris, G. F.**—Notes on Anoplura and Mallophaga, from mammals, with descriptions of 4 n. sps. and a n. var. of Anoplura, **5,** xxiii, 97-120.

ORTHOPTERA. **Allard, H. A.**—Some northern Georgia Acridiidae, **4,** 1916, 274-79. **Caudell, A. N.**—An economic consideration of O. directly affecting man, **102,** xviii, 84-93. **Rehn, J. A. G.**—Dermaptera & Orthoptera, I. (The Stanford Expedition to Brazil, 1911), **2,** xlii, 215-308.

HEMIPTERA. **Baker, A. C.**—A review of the Pterocommini, **4,** 1916, 280-289. **Harrison, L.**—A preliminary account of the structure of the mouth parts in the body louse (Pediculus vestimenti), **399,** xviii, 207-26. **Matausch, I.**—Notes on a peculiar nymph-variation of Enchenopa binotata, **6,** xxiv, 151-2. **Van Duzee, E. P.**—Check list of the Hemiptera (excepting Aphididae, etc.) of America, north of Mexico. 111 pp. (New York Entomological Society), 1916.

DeLong, D. M.—The leafhoppers or Jassoidea of Tennessee [14 new], **518,** Bull. 17. **Osborn & Drake**—The Tingitoidea of Ohio [2 n. gen.; 10 n. sps.], **460,** xx, 217-51.

LEPIDOPTERA. **Davis & Satterthwait**—Life history studies of Cirphis unipunctata, the true army worm, **447,** vi, 799-812. **Dognin, P.**—Heteroceres nouveaux de l'Amerique du Sud, Fasc. XI. **Forbes, W. T. M.**—On certain caterpillar homologies, **6,** xxiv, 137-42. **Grinnell, F., Jr.**—Butterfly records, **538,** i, 5. **Holland, W. J.**—The L. of the Isle of Pines, being a list of the species collected on the island in 1910-13, **304,** x, 487-518. **Woodruff, L. B.**—The occurrence of Archips infumatana in the eastern U. S., **6,** xxiv, 153.

Barnes & McDunnough—A new Noctuid genus, **4,** 1916, 290-1.

DIPTERA. **Aldrich, J. M.**—More light on Myiophasia, **102,** xviii, 98-100. **Bardenfleth & Ege**—On the anatomy and physiology of the air-sacs of the larva of Corethra plumicornis, **105,** lxvii, 25-42. **Corry, E. N.**—The Columbine leaf-miner, **179,** ix, 419-24. **Felt, E. P.**—A study of gall midges, IV, **204,** Bul. 186, 101-172. **Nielsen, J. C.**—Undersoglser over entoparasitiske muscidelarver hos Arthropoder, V, **105,** lxvii, 9-24. **Townsend, C. H. T.**—Note on Myiophasia aenea, **102,** xviii, 100-101.

Alexander, C. P.—New Limnophiline crane-flies from the U. S. and Canada [7 new], **6,** xxiv, 118-25. **Banks, Greene, etc.**—District

of Columbia Diptera: Syrphidae [4 new], **161,** xxix, 173-204. **Knab, F.**—A new mosquito from the eastern U. S., **161,** xxix, 161-4. **Parker, R. R.**—Sarcophagidae of New England: genus Sarcophaga [1 new sp.], **179,** ix, 438-41. **Shannon, R. C.**—Notes on some genera of Syrphidae with descriptions of new species [9 new], **102,** xviii, 101-113. **Smith, H. E.**—New Tachinidae from No. America [1 n. gen.; 5 n. sps.], **102,** xviii, 94-98. **Swenk, M. H.**—Descriptions and records of No. Am. Hippoboscidae [5 new], **6,** xxiv, 126-136.

COLEOPTERA. Barber, H. S.—A review of No. American tortoise beetles, **102,** xviii, 113-127. **Bourgoin, A.**—Description de deux Gymnetis nouveaux du Bresil, **87,** 1916, 198-200. **Champion, G. C.**—Note on the curculionid genus Mascarauxia; On some weevils attacking orchids, **8,** 1916, 185; 200-202. **Desbordes, H.**—Description d'un Orphinium nouveau et tableau des especes de ce genre, **87,** 1916, 200-2. **Howard, L. O.**—Lachnosterna larvae as a possible food supply, **179,** ix, 389-92. **Leng, C. W.**—Notes on Alleculidae, **6,** xxiv, 142-3. **Pierce, W. D.**—Notes on the habits of a dangerous genus of weevils, **179,** ix, 424-31. **Sheriffs, W. R.**—Food of the Carabidae, **536,** xxiv, 607-8.

HYMENOPTERA. Cushman, R. A.—Thersilochus conotracheli, a parasite of the plum curculio, **447,** vi, 847-55. **Elliott, E. A.**—A puzzle in the nomenclature of the hymenopterous family Stephanidae, **9,** 1916, 174-5. **Mann, W. M.**—The Stanford Expedition to Brazil, 1911. The ants of Brazil, **195,** lx, 399-490. **Pennington, W. E.**—Notes on Rhogas terminalis, **179,** ix, 401-6. **Rau, P. & N.**—Notes on the behavior of certain solitary bees, **324,** vi, 366-70. **Wheeler, W. M.**—Notes on some slave-raids of the western amazon ant (Polyergus breviceps), **6,** xxiv, 107-118. **Williams, F. X.**—Notes on the life history of Methoca stygia, **5,** xxiii, 121-25.

Bradley, J. C.—Contributions toward a monograph of the Mutillidae and their allies of America, north of Mexico, I-III [15 new], **2,** xlii, 187-198, 199-214, 309-336. **Brues, C. T.**—A new sp. of Lepidopria from No. America, **5,** xxiii, 126-7. **Cockerell, T. D. A.**—Some bees in the British Museum [2 new], **4,** 1916, 272-74. New and little known bees [2 new], **9,** 1916, 156-60. **Crawford, J. C.**—Some American H. [2 new], **102,** xviii, 127-8. **Doane, R. W.**—A new sp. of Isosoma attacking wheat in Utah, **179,** ix, 398-401. **Girault, A. A.**—A n. gen. of lelapine chalcid flies from the U. S. [1 n. sp.], **4,** 1916, 263-64. **Sladen, F. W. L.**—Bees of Canada.—Family Megachilidae [4 n. gen.; 2 n. sps.], **4,** 1916, 269-72. **Viereck, H. L.**—One new gen. and five n. sps. of ichneumon-flies, **161,** xxix, 165-72.

Doings of Societies.

American Entomological Society.

Meeting of June 12, 1916, in the Academy of Natural Sciences of Philadelphia. Dr. Henry Skinner, President, in the chair; nine persons present.

Economic Entomology.—Mr. Laurent exhibited some mounted Marguerite plants from the hothouse of M. Rothe, at Mt. Airy, Philadelphia, May, 1916, showing the ravages of an insect which destroyed hundreds of them. Dr. Skinner suggested that the first brood of potato beetles (*Leptinotarsa*) could be destroyed by removing them before they oviposited rather than by the poisoning method and at less expense and damage to the plant. Mr. E. T. Cresson, Jr., exhibited a box of insects infested by a species of Phoridae (Diptera).

A new code of by-laws was adopted and other business transacted.

R. C. Williams, Jr., *Secretary.*

Entomological Section, Academy of Natural Sciences, Philadelphia.

Meeting of May 25, 1916. Eleven persons present. Mr. Philip Laurent, Director, presiding.

Dr. Calvert read an extract from a letter from Dr. Ris, of Switzerland, complaining of the uncertainty in the delivery of mail matter to and from Europe on account of the war.

Lepidoptera. Dr. Skinner exhibited chrysalids of *Megathymus cofaqui* and *M. yuccae* collected in the yucca of Florida. He spoke on the possible abundance of these species when special attention is given to their habitats. He said that this is no doubt the case with many other apparently rare species.

Orthoptera. Mr. Rehn commented on a recent paper reclassifying the Orthoptera. Exception was taken to certain portions, particularly those referring to the "leaf-insects" or the genus *Phyllium.* He exhibited specimens of both sexes of species of this genus and one of another genus of "walking sticks," *Tropidoderus,* which shows a very great resemblance to the male sex of *Phyllium.*

Diptera. Mr. Hornig commented on the scarcity of mosquito larvae in and about Philadelphia. He said that the first brood had emerged and noticed that the females are still carrying eggs. In the discussion which followed it was the general opinion that this scarcity of the second brood was due to the continued cool weather.

Meeting of September 28, 1916. Nine persons present. Mr. Philip Laurent, Director, presiding.

Mr. Greene and Mr. Rehn discussed the persistency with which

some synonyms are still retained as valid species in some catalogues and lists. Mr. David E. Harrower was elected an associate.

Orthoptera. Mr. Hebard made a communication on four species of the genus *Periplaneta*. All were stated to be native in the United States, though but three from this country have been recognized in the literature. Certain features of coloration were shown to be of diagnostic importance, but recession and intensification of the color pattern was stated to be sometimes sufficient to lead to confusion in determining individuals of some of the species. The male primary and secondary sexual features were said to be of the greatest diagnostic value, rarely showing even slight individual variation, and differing widely in each of the species exhibited. The remarkable development of the male concealed genitalia was discussed for each species. In the discussion which followed comments were made on the views of some of the early students on the systematic value of the genitalic characters, most authors not recognizing such especially where there was any asymmetry. Mr. Rehn spoke of the importance of the genitalic characters in the separation of species and genera.

Lepidoptera. Dr. Skinner read a communication from Mr. Howard J. Shannon, 73 Union Ave., Jamaica, New York, asking that records be made of the captures of *Anosia plexippus* along the Atlantic coast. He has liberated 1000 specimens which were marked with a design cut in one of the hind wings, and will gratefully acknowledge receipt of such records. Mr. Laurent spoke about the attraction of butterflies to the butterfly-weed and exhibited specimens of the following species which were captured on the flowers of the plant during the first five days of this month: *Danais plexippus* Fab., *Argynnis cybele* Fab., *Phyciodes tharos* Dru., *Vanessa antiopa* Linn., *Pyrameis huntera* Fab., *Limenitis ursula* Fab., *Lycaena comyntas* Godt., *Pieris rapae* Linn., *Colias philodice* Godt., *Papilio glaucus* Linn. and var. *turnus* L., *P. philenor* Linn., *P. troilus* Linn., *P. polyxenes* Fab., *Pamphila hobomok* Harris, *P. peckius* Kirby, *P. cernes* Bd. & Lec. and *Eudamus tityrus* Fab. He called attention to the species *Vanessa antiopa* and *Limenitis ursula* which, he stated, seldom come to flower. Other species also were observed on this plant.

Diptera. Dr. Skinner spoke of a case of a white rabbit from a nearby suburb, infested with the larvae of a bot-fly. He commented on the apparent scarcity of adults of these flies about Philadelphia although many rabbits are found to be infested.—E. T. Cresson, Jr. *Recorder.*

Feldman Collecting Social.

Meeting of June 21, 1916, at the home of H. W. Wenzel, 5614 Stewart St., Philadelphia. Eleven members were present. Pres. H. A. Wenzel in the chair.

Coleoptera. Mr. Kaeber said he had found four pupae at Upper Darby, Pennsylvania, June 18, and one emerged on the 20th as *Pyrochroa flabellata* Fabr.; exhibited *Glischrochilus confluentus* Say from same place April 30, 1916. H. A. Wenzel exhibited *Oxyporus 5-maculatus* LeC. from Delaware County, Pennsylvania, which he collected on a very small species of fungus, *O. stygicus* Say same place, June 4, from large species of fungus and *Callimoxys sanguinicollis* Oliv., collected on hickory at Beechwood, Pennsylvania, June 4, by H. W. Wenzel.

Lepidoptera. Mr. Haimbach exhibited a box of about 100 moths collected this year at Homebrook, Pennsylvania, and recorded the following as interesting: *Apantesis figurata* Drury, *Homochlodes fritillaria* Guen., *Plagodis fervidaria* H.-S., *P. alcoolaria* Guen., *Cucullia philae* Smith and *Morrisonia sectilis* Guen. var. *vomerina* Grote.

Hymenoptera and **Strepsiptera.** Geo. M. Greene exhibited a wasp, *Sphex* sp? which he had collected at Miners Hill, back of East Falls Church, Virginia, August 14, 1914, the abdomen of which contained two examples of Strepsiptera.

Adjourned to the annex.—Geo. M. Greene, *Secretary.*

OBITUARY.

Science for October 13, 1916, announces the death of Albert John Cook on September 29. He was born in Owosso, Michigan, August 30, 1842, and attended the Michigan Agricultural College, from which he received the degrees of B. S. in 1862, M. S. in 1864, and honorary Sc. D. in 1905, and where he served as professor of zoology from 1866 to 1893. Removing then to California, he was professor of biology at Pomona College from 1894 to 1912 and State commissioner of Horticulture for five years. He was an active worker in economic entolomogy, both in Michigan and in California, and contributed many brief articles on this subject to the bulletins and reports of the Michigan Agricultural Experiment Station, to various farming journals and, less frequently, to entomological periodicals. Lists of many of these papers may be found in the various installments of the *Bibliography of the more important Contributions to American Economic Entomology* published from time to time by the Bureau of Entomology, U. S. Dept. of Agriculture. He was also active in apiculture.

EXCHANGES.

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

For Exchange—Illinois and Indiana beetles for North American specimens new to my collection.—Carl Selinger, 1338 S. 50th Ave., Cicero, Ill.

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